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ENVIRONMENTAL INVENTORY AND ANALYSIS FOR PINE BLUFF, ARKANSAS. --ETC(U)

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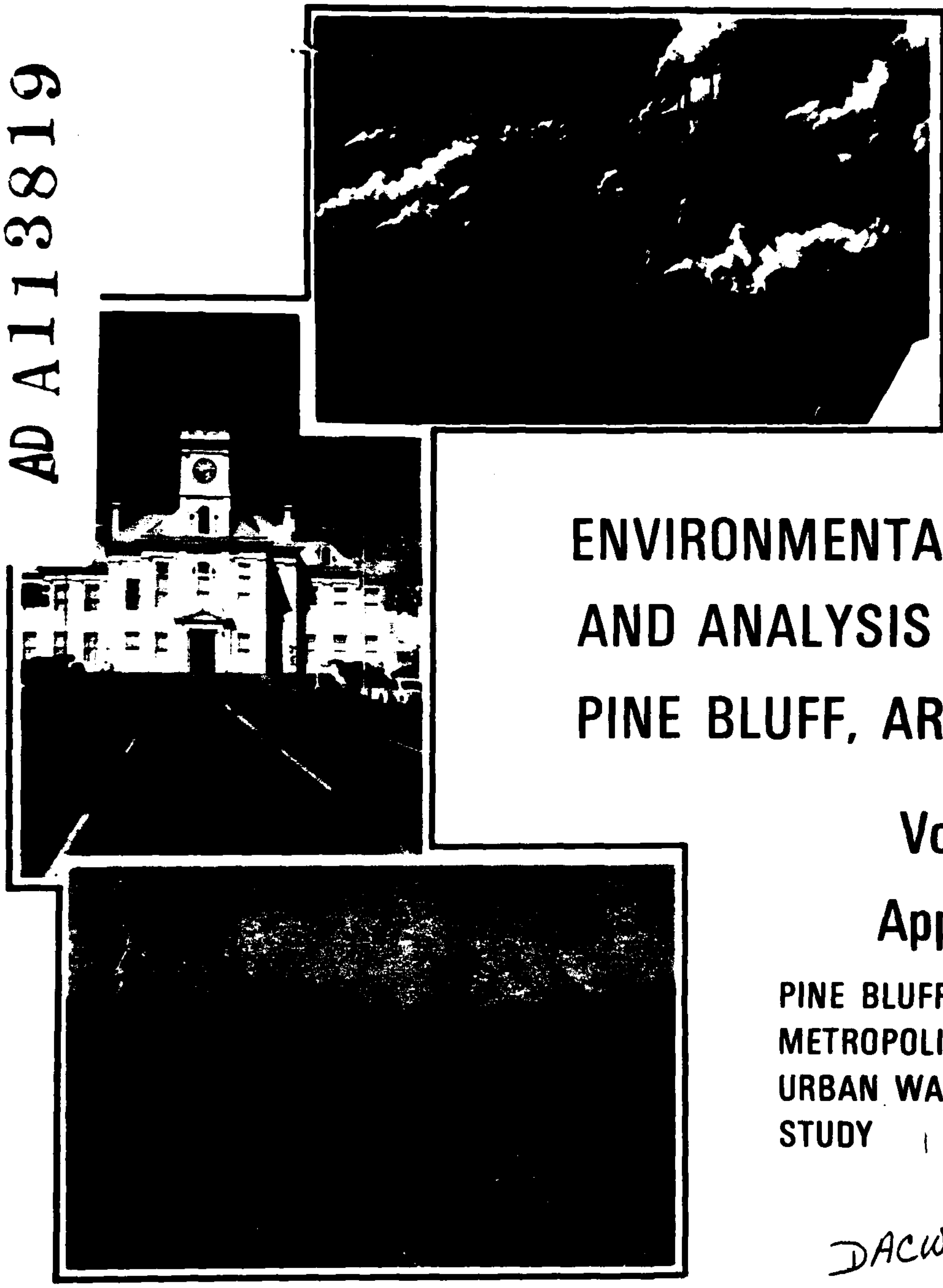

ENVIRONMENTAL INVENTORY AND ANALYSIS FOR PINE BLUFF, ARKANSAS

Volume II

Appendices

PINE BLUFF
METROPOLITAN AREA, ARKANSAS
URBAN WATER MANAGEMENT
STUDY

DACW38-74-C-0139

PREPARED FOR THE
DEPARTMENT OF THE ARMY
VICKSBURG DISTRICT, CORPS OF ENGINEERS

vtn louisiana

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ENVIRONMENTAL INVENTORY AND ANALYSIS FOR PINE BLUFF, ARKANSAS VOLUME II APPENDICES

PINE BLUFF METROPOLITAN AREA, ARKANSAS URBAN WATER MANAGEMENT STUDY

OCTOBER 1975

PREPARED FOR THE

DEPARTMENT OF THE ARMY
VICKSBURG DISTRICT, CORPS OF ENGINEERS

vtn louisiana

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Appendix A

Physical Resources

TABLE A-1

APPROXIMATE ACREAGE AND PROPORTIONATE EXTENT OF
JEFFERSON COUNTY SOILS

SOIL	AREA (ACRES)	EXTENT (PERCENT)
Amy silt loam	13,239	2.31
Amy soils, frequently flooded	8,214	1.42
Calloway silt loam, 0 to 1 percent slopes	5,619	0.95
Calloway silt loam, 1 to 3 percent slopes	4,646	0.85
Coushatta soils	422	0.07
Crevasse loamy sand	11,674	2.03
Desha clay	8,735	1.52
Grenada silt loam, 1 to 3 percent slopes	3,081	0.52
Grenada silt loam, 3 to 8 percent slopes	4,388	0.74
Hebert silt loam	16,208	2.83
Henry silt loam	3,517	0.67
Latanier clay	14,217	2.46
Lonoke silt loam, 1 to 3 percent slopes	13,081	2.25
McGehee silt loam	29,871	5.18
Morganfield silt loam	18,263	3.16
Ouachita silt loam	13,975	2.44
Perry clay	103,437	17.99
Perry-Crevasse complex, undulating	12,640	2.17
Pheba silt loam, 0 to 1 percent slopes	9,102	1.57
Pheba silt loam, 1 to 3 percent slopes	47,598	8.27
Portland clay	69,292	12.07
Rilla silt loam, 0 to 1 percent slopes	44,949	7.93
Rilla silt loam, undulating	16,686	2.92
Sacul fine sandy loam, 1 to 3 percent slopes	4,042	0.72
Sacul fine sandy loam, 3 to 8 percent slopes	8,921	1.54
Sacul fine sandy loam, 8 to 12 percent slopes	7,228	1.24
Savannah fine sandy loam, 1 to 3 percent slopes	15,368	2.65
Savannah fine sandy loam, 3 to 8 percent slopes	19,543	3.37
Sawyer silt loam, 1 to 3 percent slopes	6,410	1.18
Sawyer silt loam, 3 to 8 percent slopes	10,214	1.75
Smithdale fine sandy loam, 1 to 3 percent slopes	798	0.12
Smithdale fine sandy loam, 3 to 12 percent slopes	6,192	1.04
Water	23,421	4.07
Total	574,991	100.00

SOURCE: U.S. Department of Agriculture, 1969 - 1973.

TABLE A-2

PHYSICAL AND CHEMICAL PROPERTIES OF
JEFFERSON COUNTY SOILS

SOIL SERIES	DEPTH (In.)	TEXTURE	ACIDITY (pH)	PERM. (In./Hr.)	EROS. K	POT. T	SLOPES (Percent)
Amy	0-18	SIL, L, VFSL	4.5-5.5	0.60-2.0	--	--	0 to 1
	18-68	SIL, SICL	4.5-5.5	0.06-0.2	--	--	
	52-68	FSL, SIL, SICL	4.5-5.5	0.60-2.0	--	--	
Angie (Sawyer)	0-5	SIL, L	4.5-5.5	0.60-2.0	0.37	3	1 to 8
	5-29	SICL, L, SIL	4.5-5.5	0.20-0.6	--	--	
	29-80	SIC, C	4.5-5.5	0.06-0.2	--	--	
Cahaba (Smithdale)	0-11	LS	4.5-5.5	2.00-6.0	0.17	5	5 to 40
	0-11	SL, FSL	4.5-5.5	2.00-6.0	0.28	5	
	11-38	CL, SCL, L	4.5-5.5	0.60-2.0	0.24	--	
	38-60	L, SL	4.5-5.5	2.00-6.0	0.28	--	
Calloway	0-30	SIL, SICL	5.1-6.0	0.60-2.0	0.43	3	0 to 5
	30-53	SIL, SICL	5.1-6.0	0.06-0.2	--	--	
	53-60	SIL, SICL	5.1-7.8	0.06-0.2	--	--	
Crevasse	0-10	S, LS	5.6-8.4	6.00-20	--	--	
	0-10	SL, LFS	5.6-8.4	6.00-20	--	--	
	10-60	S, LS	5.6-8.4	6.00-20	--	--	
Desha	0-7	SIC, C	6.1-7.8	<0.2	--	--	0 to 3
	0-7	SIL, SICL	6.1-7.8	0.20-0.6	--	--	
	7-55	SIC, C	6.1-7.8	<0.06	--	--	
	55-72	SIC, C, SIL	6.1-7.8	0.60-2.0	--	--	
Grenada	0-5	SIL	4.5-6.0	0.60-2.0	0.43	3	0 to 12
	5-21	SIL, SICL	4.5-6.0	0.60-2.0	0.43	3	
	21-24	SIL	4.5-6.0	0.60-2.0	0.43	3	
	24-50	SIL, SICL	4.5-6.0	0.06-0.2	0.43	--	
	50-60	SIL, SICL	5.1-6.0	0.06-0.2	0.43	--	
Hebert	0-10	SICL, L	5.1-7.3	0.60-2.0	--	--	0 to 3
	0-10	SIL, VFSL	5.1-7.3	0.60-2.0	--	--	
	10-37	L, SICL, SIL	4.5-6.5	0.20-0.6	--	--	
	37-72	SIL, L, SICL, FSL	5.1-7.8	0.60-2.0	--	--	
Henry	0-9	SIL	4.5-5.5	0.60-2.0	--	--	0 to 2
	9-31	SIL	4.5-5.5	0.60-2.0	--	--	
	31-60	SICL	4.5-5.5	0.06-0.2	--	--	
	60-90	SIL	5.1-7.8	0.20-0.6	--	--	
Keo (Coushatta)	0-8	SIL, VFSL	5.6-7.3	0.60-2.0	0.37	5	0 to 3
	0-8	SICL	5.6-7.3	0.20-0.6	0.32	5	
	8-27	SIL, SICL	6.1-8.4	0.60-2.0	0.32	--	
	27-61	SIL, SICL, VFSL	6.6-8.4	0.60-2.0	0.37	--	

TABLE A-2 (cont.)
PHYSICAL AND CHEMICAL PROPERTIES OF
JEFFERSON COUNTY SOILS

SOIL SERIES	DEPTH (In.)	TEXTURE	ACIDITY (pH)	PERM. (In./Hr.)	EROS. K	POT. T	SLOPES (Percent)
Latanier	0-10	SICL	6.6-8.4	0.06-0.2	0.37	5	0 to 3
	0-10	C, SIC	6.6-8.4	<0.06	0.32	5	
	10-25	C, SIC	6.6-8.4	<0.06	0.37	--	
	25-60	SIL, SICL, VFSL	6.6-8.4	0.06-2.0	0.37	--	
Lonoke	0-32	FSL, SIL, LVFS	5.6-7.8	2.00-6.0	--	--	0 to 3
	32-60	VFSL, SIL, L	5.6-7.8	0.60-2.0	--	--	
	60-80	FS, SL, S	5.6-7.8	2.00->6.0	--	--	
McGehee	0-17	SIL, L, VFSL	5.1-6.0	0.60-2.0	--	--	0 to 2
	17-24	SICL, SIL	5.1-6.0	0.20-0.6	--	--	
	24-52	SIC, C	5.1-7.8	0.06-0.2	--	--	
	52-60	SIC, C	5.1-8.4	0.06-0.2	--	--	
Morganfield	0-50	SIL	6.1-7.8	0.63-2.0	--	--	0 to 2
Ouachita	0-19	SIL, L	4.5-6.0	0.60-2.0	--	--	0 to 1
	19-69	SIL, L, SICL	4.5-5.5	0.20-0.6	--	--	
	69-77	FSL, SIL, LFS	4.5-5.5	0.60-6.0	--	--	
Perry	0-6	SICL	4.5-6.0	0.06-0.2	--	--	0 to 3
	0-6	C, SIC	4.5-6.0	<0.06	--	--	
	6-30	C	5.1-7.3	<0.06	--	--	
	30-60	C	6.1-8.4	<0.06	--	--	
Pheba	0-8	SIL, L, FSL	4.0-5.5	0.06-2.0	0.37	0.3	0 to 3
	8-21	SIL, L	4.0-5.5	0.60-2.0	--	--	
	21-60	SIL, L, SICL	4.0-5.5	0.20-0.6	--	--	
Portland	0-8	SIL	4.5-5.5	0.20-2.0	--	--	0 to 3
	0-8	SIC, C	4.5-5.5	<0.06	--	--	
	8-18	C	4.5-5.5	<0.06	--	--	
	18-45	C	6.1-8.4	<0.06	--	--	
	45-65	SR-SIL-C	6.1-8.4	<0.06	--	--	
Rilla	0-8	SIL, L, VFSL	4.5-7.3	0.60-2.0	0.37	5	0 to 5
	8-35	SICL, CL, SIL	3.6-5.5	0.60-2.0	0.32	--	
	35-69	L, SICL, SIC	4.5-8.4	0.60-2.0	0.32	--	
Sacul	0-10	SL, FSL, L	4.5-5.5	0.60-2.0	0.37	3	1 to 40
	10-44	C, SIC	4.5-5.5	0.06-0.2	--	--	
	44-72	SICL, SIL	4.5-5.5	0.20-0.6	--	--	
Savannah	0-6	FSL, SL	4.5-5.5	0.63-2.0	0.37	3	0 to 8
	0-6	SIL, L	4.5-5.5	0.63-2.0	--	--	
	6-28	L	4.5-5.5	0.63-2.0	--	--	
	28-44	L	4.5-5.5	0.20-0.63	--	--	
	44-68	SCL	4.5-5.5	0.20-0.63	--	--	

SOURCE: U.S. Department of Agriculture, 1969 - 1973.

TABLE A-3

SUITABILITY AND LIMITATIONS OF JEFFERSON COUNTY
SOILS FOR SOURCE MATERIAL

Soil Series	Source Material			
	Roadfill	Sand	Gravel	Topsoil
Amy	Poor, wetness	Unsuited	Unsuited	Poor: wetness
Angie (Sawyer)	Poor: low strength; shrink-swell	Unsuited: excess fines	Unsuited: excess fines	Fair: too clayey
Cahaba (Smithdale)	Good to poor: slope	Unsuited: excess fines	Unsuited: excess fines	Good to poor: slope
Calloway	Fair: traffic supporting capacity; wetness	Unsuited	Unsuited	Good
Crevasse	Good	Good	Unsuited	Poor: too sandy
Desha	Poor: low strength	Unsuited	Unsuited	Poor: too clayey
Grenada	Fair: wetness; low strength	Unsuited	Unsuited	Good
Hebert	Fair: plastic-ity; wetness	Unsuited	Unsuited	Fair: thickness of material; texture on silty clay loam type
Henry	Poor: wetness	Unsuited	Unsuited	Poor: wetness
Keo (Coushatta)	Fair: low strength; shrink-swell	Unsuited: excess fines	Unsuited: excess fines	Good to fair: too clayey
Latanier	Poor: low strength; shrink-swell	Unsuited: excess fines	Unsuited: excess fines	Poor: too clayey
Lonoke	Fair: low strength	Unsuited	Unsuited	Good
McGehee	Severe: low strength; shrink-swell	Unsuited: excess fines	Unsuited: excess fines	Good
Morganfield	Fair: easily eroded; traf-fic supporting capacity	Unsuited	Unsuited	Good
Ouachita	Fair: low strength	Unsuited	Unsuited	Good
Perry	Poor: wetness; low strength; shrink-swell	Unsuited: excess fines	Unsuited: excess fines	Poor: wetness; too clayey
Pheba	Fair: low strength; wetness	Unsuited	Unsuited	Good
Portland	Severe: low strength; shrink-swell	Unsuited	Unsuited	Poor: too clayey
Rilla	Fair: low strength; shrink-swell	Unsuited: excess fines	Unsuited: excess fines	Fair: thin layer
Sacul	Severe: low strength; shrink-swell; slope	Unsuited	Unsuited	Poor: thin layer; too clayey; slope
Savannah	Fair: traffic-supporting; wetness	Unsuited	Unsuited	Good

(SOURCE: U.S. Dept. of Agri., 1969-73.)

Table A-4

DEGREE AND KIND OF LIMITATION FOR TOWN AND COUNTRY PLANNING

SOIL SERIES	HOUSING DEVELOPMENTS			RECREATION AREAS			LIGHT INDUSTRIES	TRAFFICWAYS
	Foundations of Dwellings	Septic Tank Filter Fields	Sewage Lagoons	Campsites	Picnic Areas	Playgrounds Paths and Trails		
Amy	Severe: moderate bearing strength; poorly drained; seasonal high water table; some areas subject to frequent flooding.	Severe: slow percolation; seasonal high water table; some areas subject to frequent flooding.	Moderate: fair embankment material; severe in areas subject to frequent flooding.	Severe: poorly drained; seasonal high water table; some areas subject to frequent flooding.	Severe: poorly drained; seasonal high water table; some areas subject to frequent flooding.	Severe: poorly drained; seasonal high water table; some areas subject to frequent flooding.	Severe: poorly drained; seasonal high water table; some areas subject to frequent flooding; corrosivity.	Severe: moderate traffic-supporting capacity; seasonal high water table; some areas subject to frequent flooding.
Angie (Sawyer)	Severe: low strength; shrink-swell potential; wetness.	Severe: slow percolation	Slight to Severe: severity increases with increased slope.	Moderate: slow percolation	Slight	Moderate to severe: slow percolation; slope	Severe: low strength; shrink-swell potential; wetness; high corrosivity.	Severe: low strength; shrink-swell potential.
Cahaba (Smithdale)	Slight: 5-8% slopes; Moderate: 8-15% slopes; Severe: 15-40% slopes	Slight: 5-8% slopes; Moderate 8-15% slopes; Severe: 15-40% slopes	Severe: slow percolation; slope.	Slight: 5-8% slopes; Moderate: 8-15% slopes; Severe: 15-40% slopes	Slight: 5-8% slopes; Moderate: 8-15% slopes; Severe: 15-40% slopes	Slight: 5-8% slopes; Moderate: 8-15% slopes; Severe: 15-40% slopes	Moderate: 5-8% slopes; Severe: 8-40% slopes	Slight: 5-8% slopes; Moderate: 8-15% slopes; Severe: 15-40% slopes
Calloway	Moderate: seasonal high water table; somewhat poorly drained; moderate bearing strength.	Severe: seasonal high water table; slow percolation.	Moderate: features favorable for lagoons. Fair material for reservoirs sites.	Severe: somewhat poorly drained; seasonal high water table.	Moderate: somewhat poorly drained; seasonal high water table.	Severe: somewhat poorly drained; seasonal high water table.	Moderate: Seasonal high water table; somewhat poorly drained; moderate bearing strength.	Moderate to severe: seasonal high water table; moderate traffic-supporting capacity.
Crevasse (For Perry part of unit; see Perry series.)	Severe: flood hazard.	Severe: flood hazard.	Severe: flood hazard; rapid percolation.	Severe: flood hazard; too sandy.	Severe: too sandy.	Severe: flood hazard; too sandy	Severe: flood hazard.	Severe: flood hazard.
Desha	Severe: high shrink-swell potential; seasonal high water table; low bearing strength; somewhat poor drainage; ponding.	Severe: very slow permeability; seasonal high water table	Severe where subject to deep flooding; otherwise, slight	Severe: fair to poor trafficability; somewhat poor drainage; seasonal high water table; very slow permeability.	Severe: fair to poor trafficability; seasonal high water table.	Severe: fair to poor trafficability; somewhat poor drainage; seasonal high water table; very slow permeability.	Severe: high shrink-swell potential; low bearing strength; seasonal high water table; somewhat poor drainage; ponding; high corrosivity of uncoated steel.	Severe: seasonal high water table; low traffic-supporting capacity; somewhat poor drainage; high shrink-swell potential.

Table A-4 (continued)

DEGREE AND KIND OF LIMITATION FOR TOWN AND COUNTRY PLANNING CONTINUED

SOIL SERIES	HOUSING DEVELOPMENTS			RECREATION AREAS			LIGHT INDUSTRIES	TRAFFICWAYS
	Foundations of Dwellings	Septic Tank Filter Fields	Sewage Lagoons	Campsites	Picnic Areas	Playgrounds Paths and Trails		
Grenada	Moderate: moderate bearing strength; moderately well drained.	Severe: slow percolation.	Slight to severe: slope is excessive for lagoons in some areas. Fair to good material for reservoir sites.	Moderate: slow permeability.	Slight	Moderate if slopes are less than 6%; severe if slopes are more than 6%.	Moderate: moderate bearing strength; slopes.	Moderate: seasonal high water table in level areas; moderate traffic-supporting capacity.
Hebert	Moderate: seasonal high water table; somewhat poorly drained; moderate bearing strength.	Severe: slow percolation; seasonal high water table.	Moderate to severe: moderate permeability below a depth of about 40 inches. Fair to good material for reservoir sites.	Moderate: somewhat poorly drained; moderately slow permeability.	Moderate: somewhat poorly drained.	Moderate: somewhat poorly drained; moderately slow permeability.	Moderate: seasonal high water table; moderate bearing strength; somewhat poorly drained.	Moderate to severe: seasonal high water table; moderate traffic supporting capacity.
Henry	Severe: seasonal high water table.	Very severe: percolation rate is slow; high water table; presumptive bearing strength.	Severe: seasonal high water table; presumptive bearing strength.	Severe: poor trafficability.	Severe: poor trafficability.	Very severe: trafficability.	Severe: seasonal high water table; presumptive bearing strength.	Severe: seasonal high water table; poor traffic-supporting capacity.
Keo (Coushatta)	Moderate: moderate bearing strength; moderate shrink-swell potential.	Severe: moderately slow permeability.	Slight to Moderate: possible moderate lateral seepage; fair material for reservoir sites. Severe where subject to deep flooding.	Moderate: fair trafficability; moderately slow permeability.	Slight to Moderate: good to fair trafficability.	Moderate: good to fair trafficability; moderately slow permeability.	Moderate: moderate bearing strength; moderate shrink-swell potential; moderate corrosivity of uncoated steel.	Moderate: moderate traffic-supporting capacity; moderate shrink-swell potential.
Latanier	Severe: shrink-swell potential; wetness; flood hazard; low strength.	Severe: slow percolation; wetness; flood hazard.	Severe: flood hazard.	Severe: too clavey; flood hazard.	Severe: too clavey; flood hazard.	Severe: too clavey.	Severe: flood hazard; wetness; shrink-swell potential.	Severe: shrink-swell potential; low strength.
Lonoke	Slight	Moderate: moderate percolation rate; slope.	Slight	Slight	Slight	Slight	Moderate: presumptive bearing strength.	Moderate: water table and traffic supporting capacity.

Table A-4 (continued)

DEGREE AND KIND OF LIMITATION FOR TOWN AND COUNTRY PLANNING CONTINUED

SOIL SERIES	HOUSING DEVELOPMENTS			RECREATION AREAS			LIGHT INDUSTRIES	TRAFFICWAYS
	Foundations of Dwellings	Septic Tank Filter Fields	Sewage Lagoons	Campsites	Picnic Areas	Playgrounds Paths and Trails		
McGehee	Moderate to severe seasonal high water table; moderate bearing strength; somewhat poor drainage; high shrink-swell potential below a depth of 16 in.	Severe: slow permeability; seasonal high water table.	Slight	Severe: somewhat poor drainage; seasonal high water table; slow permeability	Moderate: somewhat poor drainage.	Severe: somewhat poor drainage; slow permeability; seasonal high water table.	Moderate to severe: seasonal high water table; moderate bearing strength; somewhat poor drainage; high corrosivity of uncoated steel.	Moderate to severe: seasonal high water table; moderate to low traffic-supporting capacity; high shrink-swell potential at a depth below 16 inches.
Morganfield	Severe: flood hazard.	Severe: flood hazard.	Moderate: permeable material.	Moderate: flood hazard; slight when not subject to flooding.	Moderate: flood hazard; slight when not subject to flooding.	Moderate: flood hazard; slight when not subject to flooding.	Severe: flood hazard; low bearing strength; stability.	Severe: flood hazard.
Ouachita	Severe: subject to frequent flooding; moderate bearing strength.	Severe: subject to frequent flooding; slow percolation.	Severe: subject to frequent flooding; fair embankment material.	Severe: subject to frequent flooding.	Moderate: subject to frequent flooding.	Severe: subject to frequent flooding.	Severe: subject to frequent flooding.	Severe: subject to frequent flooding; moderate traff c supporting capacity.
***Perry (For Crevasse part of unit, see Crevasse series.)**	Severe: high shrink-swell potential; seasonal high water table; low bearing strength; poorly drained; frequent flooding in some areas.	Severe: seasonal high water table; slow percolation; frequent flooding in some areas.	Moderate to severe: features favorable for lagoons except in areas subject to flooding; fair to good material for reservoir sites.	Severe: poor trafficability; poorly drained; frequent flooding in some areas; seasonal high water table.	Severe: poor trafficability; poorly drained; frequent flooding in some areas; seasonal high water table.	Severe: poor trafficability; poorly drained; very slow permeability; seasonal high water table; frequent flooding in some areas.	Severe: high shrink-swell potential; low bearing strength; poorly drained; seasonal high water table; frequent flooding in some areas.	Severe: high shrink-swell potential; low traffic-supporting capacity; seasonal high water table; frequent flooding in some areas.
Pheba	Severe: moderate bearing strength; somewhat poorly drained; seasonal high water table.	Severe: slow percolation; seasonal high water table.	Moderate: fair embankment material.	Severe: somewhat poorly drained; seasonal high water table.	Moderate: somewhat poorly drained; seasonal high water table.	Severe: somewhat poorly drained; seasonal high water table.	Severe: moderate bearing strength; somewhat poorly drained; seasonal high water table; high corrosivity.	Severe: moderate traffic-supporting capacity; seasonal high water table.

Table A-4 (continued)

DEGREE AND KIND OF LIMITATION FOR TOWN AND COUNTRY PLANNING CONTINUED

SOIL SERIES	HOUSING DEVELOPMENTS			RECREATION AREAS			LIGHT INDUSTRIES	TRAFFICWAYS
	Foundations of Dwellings	Septic Tank Filter Fields	Sewage Lagoons	Campsites	Picnic Areas	Playgrounds Paths and Trails		
Portland	Severe: high shrink-swell potential; seasonal high water table; low bearing strength; somewhat poorly drained; ponding; frequent flooding in some areas.	Severe: seasonal high water table; slow percolation; frequent flooding in some areas.	Moderate to severe fair to good material for reservoir sites; features favorable for lagoons except in areas subject to flooding.	Severe: poor trafficability; somewhat poorly drained; ponding; frequent flooding in some areas; very slow permeability; seasonal high water table.	Severe: poor trafficability; somewhat poorly drained; ponding; frequent flooding in some areas; very slow permeability; seasonal high water table.	Severe: poor trafficability; somewhat poorly drained; ponding in some areas; frequent flooding in some areas; seasonal high water table.	Severe: high shrink-swell potential; low bearing strength; seasonal high water table; somewhat poorly drained; ponding; frequent flooding in some areas.	Severe: high shrink-swell potential; low traffic-supporting capacity; seasonal high water table; frequent flooding in some areas.
Rilla	Moderate: moderate bearing strength.	Moderate to severe: moderately slow percolation.	Severe: moderate permeability below depth of 53 inches; subject to piping.	Slight	Slight	Slight	Moderate: moderate bearing strength.	Moderate: moderate traffic-supporting capacity.
Sacul	Moderate if slopes are less than 15%; moderate bearing strength; moderate shrink-swell potential; severe if slopes are more than 15%	Severe: slow percolation.	Moderate if slopes are less than 7%, severe if slopes are steeper; fair to good embankment material.	Moderate if slopes are less than 15%; slow permeability; severe if slopes are more than 15%.	Slight if slopes are less than 8%; moderate if slopes are more than 15%.	Moderate if slopes are less than 6%; slow permeability; severe if slopes are more than 6%.	Moderate if slopes are less than 8%; moderate bearing strength; moderate shrink-swell potential; severe if slopes are more than 8%.	Severe: low traffic-supporting capacity; moderate shrink-swell potential; slopes.
Savannah	Moderate: stable; moderately well drained material.	Moderate: moderate percolation rate.	Moderate: moderate percolation rate.	Moderate: slow percolation.	Slight	Slight to moderate: slopes; slow percolation.	Moderate: wetness	Moderate: low strength.

*When considering Perry-Crevasse complex, undulating, one must consider properties of both series.

SOURCE: U.S. Department of Agriculture, 1969-73.

Table A-5

SOIL SUITABILITY FOR AGRICULTURE AND WOODLAND PRODUCTION

Capability and Predicted Yields--Crops and Pasture (High Level Management)

Soil	Corn (bu.)	Cotton (lbs.)	Soybeans (bu.)	Rice (bu.)	Bahiagrass (AUM)[1]	Common Burmu. Gr. (AUM)[1]	Fescue (AUM)[1]
Amy Silt Loam		450	25		7.5	6.0	6.0
Amy Frequently Flooded		450	25		7.5	6.0	
Calloway Silt Loam 0-1% Slopes	85	650	35	120	8.0	6.5	8.0
Calloway Silt Loam 1-3% Slopes	80	650	30	120	8.0	6.5	8.0
Coushatta Soils	85	825	40			8.0	
Crevasse Loamy Sand							
Desha Clay		525	35	90		7.0	9.0
Grenada Silt Loam 1-3% Slopes	85	600	35		8.5	7.0	8.0
Grenada Silt Loam 3-8% Slopes	65	550	30		8.0	6.5	7.5

Woodland Suitability

Soil	Management Problems: Erosion Hazard	Equip. Limit	Seedling Mort'y	Windth. Hazard	Plant Compet.	Potential Important Trees	Prod. Site Index
Amy Silt Loam	Slight	Severe	Severe	Slight	Slight	Shortleaf Loblolly Sweetgum	80 90 90
Amy Frequently Flooded	Slight	Severe	Moderate to Severe	Slight	Slight	Loblolly Sweetgum Water Oaks	90 90 90
Calloway Silt Loam 0-1% Slopes	Slight	Moderate	Slight to Moderate	Slight	Moderate to Severe	Loblolly Shortleaf Cherrybark Sweetgum	80 70 70 80
Calloway Silt Loam 1-3% Slopes	Slight	Moderate	Slight to Moderate	Slight	Moderate to Severe	Loblolly Shortleaf Cherrybark Sweetgum	80 70 70 80
Coushatta Soils	Slight	Slight	Slight	Slight	Slight	Cottonwood Sweetgum Pecan Cherrybark	100 100
Crevasse Loamy Sand	Slight	Moderate	Severe	Slight	Slight	Loblolly Sweetgum White Oak Cottonwood	90 90 90 100
Desha Clay	Slight	Severe	Moderate	Slight	Slight	Cottonwood Cherrybark Sweetgum Willow Oak	100 90 90 90
Grenada Silt Loam 1-3% Slopes	Moderate to Severe	Moderate	Slight	Slight	Moderate	Loblolly Shortleaf Sweetgum Cherrybark	80 80 80 70
Grenada Silt Loam 3-8% Slopes	Moderate to Severe	Moderate	Slight	Slight	Moderate	Loblolly Shortleaf Sweetgum Cherrybark	80 80 80 70

Table A-5 (continued)

SOIL SUITABILITY FOR AGRICULTURE AND WOODLAND PRODUCTION CONTINUED

	Capability and Predicted Yields--Crops and Pasture (High Level Management)							Woodland Suitability						
								Management Problems					Potential	Prod.
	Corn (bu.)	Cotton (lbs.)	Soybeans (bu.)	Rice (bu.)	Bahiagrass (AUM)[1]	Common Burmu. Gr. (AUM)[1]	Fescue (AUM)[1]	Erosion Hazard	Equip. Limit	Seedling Mort'y	Windth. Hazard	Plant Compet.	Important Trees	Site Index
Hebert Silt Loam	90	800	35	85	8.5	7.0	8.0	Slight	Moderate	Slight			Cherrybark Water Oak Nuttall Sweetgum Cottonwood	90 90 90 90 100
Henry Silt Loam	50	500	30	120	7.0	6.5	7.0	Slight	Moderate	Slight	Slight	Moderate to Severe	Shortleaf Loblolly Sweetgum Cherrybark	78 80 80 80
Latanier Clay		650	35			6.0	9.0	Slight	Moderate	Moderate	Slight	Slight	Cottonwood Sweetgum Cherrybark Water Oak	110 90 90 90
Lonoke Silt Loam 1-3% Slopes	85	800	35			9.0	8.0	Slight	Slight	Slight	Slight	Slight	Cottonwood Water Oak Cherrybark Sweetgum	95 90 90 90
McGehee Silt Loam		575	30	85		9.0	8.0	Slight	Moderate to Severe	Slight to Moderate	Slight	Slight	Cottonwood Cherrybark Willow Oak Sweetgum Nuttall Oak	100 95 95 95 90
Morganfield Silt Loam	125	1,000	45		9.0	12.3	9.0	Slight	Slight	Slight	Slight	Slight	Cottonwood Cherrybark Nuttall Oak Water Oak	115 110 110 110
Ouachita Silt Loam			35		7.5	7.0		Slight	Moderate	Slight to Moderate	Slight	Slight	Sweetgum Nuttall Oak Water Oak Cottonwood Loblolly	100 100 100 100 100
Perry Clay		500	35	130		6.5	8.5	Slight	Severe	Slight	Slight	Severe	Cottonwood Sweetgum Green Ash	90 90 72

Table A-5 (continued)

SOIL SUITABILITY FOR AGRICULTURE AND WOODLAND PRODUCTION CONTINUED

Capability and Predicted Yields--Crops and Pasture (High Level Management)							
Soil	Corn (bu.)	Cotton (lbs.)	Soybeans (bu.)	Rice (bu.)	Bahiagrass (AUM)[1]	Common Burmu. Gr. (AUM)[1]	Fescue (AUM)[1]
Perry-Crevasse Complex Undulating						6.5	8.5
Pheba Silt Loam 0-1% Slopes	75	575	30	130		6.5	8.5
Pheba Silt Loam 1-3% Slopes	75	575	30		8.0		7.0
Portland Clay		600	35	130		7.0	9.0
Rilla Silt Loam 0-1% Slopes	98	900	40		9.0	8.5	9.0
Rilla Silt Loam Undulating	90	850	35		9.0	8.5	9.0
Sacul Fine Sandy Loam 1-3% Slopes	35	400	25		7.5	6.5	5.0
Sacul Fine Sandy Loam 3-8% Slopes					7.5	6.5	5.0
Sacul Fine Sandy Loam 8-12% Slopes					6.5	5.5	5.0

	Woodland Suitability						
	Management Problems					Potential	Prod.
Soil	Erosion Hazard	Equip. Limit	Seedling Mort'y	Windth. Hazard	Plant Compet.	Important Trees	Site Index
Perry-Crevasse Complex Undulating	Slight	Severe	Severe	Slight	Slight	Cottonwood Sweetgum	95 90
Pheba Silt Loam 0-1% Slopes	Moderate	Moderate	Slight	Slight	Moderate	Loblolly Shortleaf Cherrybark Sweetgum Water Oak	90 80 90 90 90
Pheba Silt Loam 1-3% Slopes	Moderate	Moderate	Slight	Slight	Moderate	Loblolly Shortleaf Cherrybark Sweetgum Water Oak	90 80 90 90 90
Portland Clay	Slight	Severe	Slight	Slight	Severe	Cottonwood Sweetgum Cherrybark	90 90 90
Rilla Silt Loam 0-1% Slopes	Slight	Slight	Slight	Slight	Slight	Cottonwood Water Oak Cherrybark Nuttall Oak Sweetgum	100 90 90 90 90
Rilla Silt Loam Undulating	Slight	Slight	Slight	Slight	Slight	Cottonwood Water Oak Cherrybark Nuttall Oak Sweetgum	100 90 90 90 90
Sacul Fine Sandy Loam 1-3% Slopes	Moderate	Slight to Moderate	Slight to Moderate	Slight	Slight	Loblolly Shortleaf	80 70
Sacul Fine Sandy Loam 3-8% Slopes	Moderate	Slight to Moderate	Slight to Moderate	Slight	Slight	Loblolly Shortleaf	80 70
Sacul Fine Sandy Loam 8-12% Slopes	Moderate	Slight to Moderate	Slight to Moderate	Slight	Slight	Loblolly Shortleaf	80 70

Table A-5 (continued)

SOIL SUITABILITY FOR AGRICULTURE AND WOODLAND PRODUCTION CONTINUED

	Capability and Predicted Yields--Crops and Pasture (High Level Management)							Woodland Suitability						
								Management Problems					Potential	Prod.
	Corn (bu.)	Cotton (lbs.)	Soybeans (bu.)	Rice (bu.)	Bahiagrass (AUM)[1]	Common Burmu. Gr. (AUM)[1]	Fescue (AUM)[1]	Erosion Hazard	Equip. Limit	Seedling Mort'y	Windth. Hazard	Plant Compet.	Important Trees	Site Index
Savannah Silt Loam 1-3% Slopes	50	550	25			7.0	7.0	Slight	Moderate	Slight	Slight	Slight	Loblolly Slash Pine Longleaf	90 90 80
Sawyer Silt Loam 3-8% Slopes	45	500	20			7.0	7.0	Slight	Moderate	Slight	Slight	Slight	Loblolly Slash Pine Longleaf	90 90 80
Smithdale Fine Sandy Loam 1-3% Slopes	55	500	25			5.5		Slight	Slight	Slight	Slight	Moderate	Slash Pine Loblolly Longleaf	85 85 70
Smithdale Fine Sandy Loam 3-12% Slopes	50	450	25			5.0		Slight	Slight	Slight	Slight	Moderate	Slash Pine Loblolly Longleaf	85 85 70

[1]A.U.M. stands for animal-unit-month. The figures represent the number of months that 1 acre (0.4 ha.) will provide grazing for one animal unit (one cow, steer, or horse, five hogs, or seven sheep) without injury to the pasture.

SOURCE: U.S. Department of Agriculture, 1969-73.

Table A-6

SOIL SUITABILITY FOR WILDLIFE ELEMENTS AND KINDS OF WILDLIFE

Soil	Wildlife Habitat Elements						Classes of Wildlife		
	Grain and Seed Crops	Grasses and Legumes	Wild Herbaceous Plants	Hardwood Woody Plants	Wetland Food and Cover Plants	Shallow-water Developments	Openland	Woodland	Wetland
Amy Silt Loam	Poorly Suited	Suited	Suited	Well Suited	Well Suited	Well Suited	Suited	Well Suited	Well Suited
Amy Soils, Frequently Flooded	Poorly Suited	Suited	Suited	Well Suited	Well Suited	Poorly Suited	Poorly Suited	Well Suited	Well Suited
Calloway Silt Loam, 0 to 1 Percent Slopes	Well Suited	Well Suited	Well Suited	Well Suited	Suited	Well Suited	Well Suited	Well Suited	Well Suited
Calloway Silt Loam, 1 to 3 Percent Slopes	Suited	Well Suited	Well Suited	Well Suited	Poorly Suited	Poorly Suited	Well Suited	Suited	Poorly Suited
Coushatta Soils	Well Suited	Well Suited	Well Suited	Well Suited	Unsuited	Unsuited	Well Suited	Well Suited	Unsuited
In Frequently Flooded Areas	Poorly Suited	Suited	Suited	Well Suited	Unsuited	Unsuited	Suited	Suited	Unsuited
Crevasse Loamy Sand	Poorly Suited	Suited	Suited	Poorly Suited	Poorly Suited	Unsuited	Suited	Poorly Suited	Unsuited
Desha Clay	Suited	Suited	Suited	Well Suited	Suited	Well Suited	Suited	Well Suited	Suited
In Frequently Flooded Areas	Poorly Suited	Suited	Suited	Well Suited	Suited	Poorly Suited	Suited	Suited	Suited
Grenada Silt Loam, 1 to 3 Percent Slopes	Well Suited	Well Suited	Well Suited	Well Suited	Unsuited	Suited To Poorly Suited	Well Suited	Well Suited	Poorly Suited
Grenada Silt Loam, 3 to 8 Percent Slopes	Suited	Well Suited	Well Suited	Well Suited	Unsuited	Unsuited	Well Suited	Well Suited	Unsuited
Hebert Silt Loam	Well Suited	Well Suited	Well Suited	Well Suited	Suited	Suited	Well Suited	Well Suited	Suited
Henry Silt Loam	Suited	Suited	Suited	Suited	Well Suited	Well Suited	Suited	Suited	Well Suited
Latanier Clay	Suited	Suited	Suited	Well Suited	Well Suited	Well Suited	Suited	Well Suited	Well Suited
Lonoke Silt Loam, 1 to 3 Percent Slopes	Well Suited	Well Suited	Well Suited	Well Suited	Poorly Suited	Unsuited	Well Suited	Well Suited	Unsuited
McGehee Silt Loam	Well Suited	Well Suited	Well Suited	Well Suited	Suited	Well Suited	Well Suited	Well Suited	Suited
Morganfield Silt Loam	Suited	Suited	Suited	Well Suited	Poorly Suited	Poorly Suited	Well Suited	Well Suited	Poorly Suited
Ouachita Silt Loam	Suited	Suited	Suited	Well Suited	Poorly Suited	Poorly Suited	Suited	Well Suited	Poorly Suited
Perry Clay	Suited	Suited	Suited	Well Suited	Well Suited	Well Suited	Suited	Well Suited	Well Suited
Perry-Crevasse Complex, Undulating	Poorly Suited	Suited	Suited	Suited	Suited	Poorly Suited	Suited	Suited	Poorly Suited
Pheba Silt Loam, 0 to 1 Percent Slopes	Suited	Well Suited	Well Suited	Well Suited	Suited	Suited	Well Suited	Well Suited	Suited
Pheba Silt Loam, 1 to 3 Percent Slopes	Suited	Suited	Well Suited	Well Suited	Suited	Suited	Suited	Well Suited	Suited
Portland Clay	Well Suited	Well Suited	Well Suited	Well Suited	Well Suited	Well Suited	Well Suited	Well Suited	Well Suited
Rilla Silt Loam, 0 to 1 Percent Slopes	Well Suited	Well Suited	Well Suited	Well Suited	Unsuited	Poorly Suited	Well Suited	Well Suited	Unsuited
Rilla Silt Loam, Undulating	Well Suited	Well Suited	Well Suited	Well Suited	Poorly Suited	Unsuited	Well Suited	Well Suited	Unsuited
Sacul Fine Sandy Loam, 1 to 3 Percent Slopes	Suited	Well Suited	Well Suited	Well Suited	Unsuited	Poorly Suited	Well Suited	Well Suited	Unsuited
Sacul Fine Sandy Loam, 3 to 8 Percent Slopes	Suited	Well Suited	Well Suited	Well Suited	Unsuited	Unsuited	Well Suited	Well Suited	Unsuited
Sacul Fine Sandy Loam, 8 to 12 Percent Slopes	Poorly Suited	Well Suited	Well Suited	Well Suited	Unsuited	Unsuited	Suited	Well Suited	Unsuited
Savannah Fine Sandy Loam, 1 to 3 Percent Slopes	Well Suited	Well Suited	Well Suited	Well Suited	Poorly Suited	Poorly Suited	Well Suited	Well Suited	Poorly Suited
Savannah Fine Sandy Loam, 3 to 8 Percent Slopes	Well Suited	Well Suited	Well Suited	Well Suited	Poorly Suited	Unsuited	Well Suited	Well Suited	Unsuited
Sawyer Silt Loam 1 to 3 Percent Slopes	Well Suited	Well Suited	Well Suited	Well Suited	Poorly Suited	Poorly Suited	Well Suited	Well Suited	Poorly Suited
Sawyer Silt Loam, 3 to 8 Percent Slopes	Suited	Well Suited	Well Suited	Well Suited	Poorly Suited	Unsuited	Well Suited	Well Suited	Unsuited
Smithdale Fine Sandy Loam 1 to 3 Percent Slopes	Suited	Well Suited	Well Suited	Well Suited	Unsuited	Unsuited	Well Suited	Well Suited	Unsuited
Smithdale Fine Sandy Loam 3 to 12 Percent Slopes	Suited	Well Suited	Well Suited	Well Suited	Unsuited	Unsuited	Well Suited	Well Suited	Unsuited

SOURCE: U.S. Department of Agriculture, 1969-73.

SUBSURFACE STRATIGRAPHY

A. Paleozoic Era. Paleozoic age rocks outcrop about 18 miles northwest of Jefferson County. The Paleozoic rocks are relatively old, well-compacted and folded beds of sandstone and shale. These basement rocks formed during the mostly marine deposition periods of Cambrian through Pennsylvanian times. Little else is known of the structural attitudes of the downwarped, and possibly faulted, Paleozoic rocks lying immediately beneath the Tertiary or Upper Cretaceous sediments in the embayment.

B. Mesozoic Era. Upper Cretaceous sediments overlie the Paleozoic rocks of Jefferson County. The Lower Cretaceous, Jurassic, Triassic and Permian sediments, however, are absent from the county. Three groups are predominant in the Upper Cretaceous series: Austin, Taylor and Navarro.

1. Austin. Formations in the Austin Group include the Pre-Ozan and Basal Detrital units. The Basal Detrital Unit is characterized according to Caplan (1954):

> The Basal Detrital Unit is a medium to coarse-grained, glauconitic, quartzitic sandstone. Pyrite, siderite, phosphatic nodules and lignite, the latter often being found at the top and bottom of the formation, are characteristic of the basal unit. The quartz grains comprising the sandstone frequently have a greenish tinge and become coarser toward the base of the unit.

Being a transgressive marginal unit deposited on a peneplaned surface, the sandstone tends to show a relationship to the terrain it has overlapped; consequently, rounded, frosted quartz grains may be found in the basal unit where the St. Peter, Everton or Joachim make up the pre-Cretaceous areal surface. In like fashion, black shale fragments should be present in the unit where Atoka, Morrow or Mississippian shales form the Paleozoic floor of the embayment. Cherts may occur in the basal unit, or constitute it, where cherty Ordovician limestones and dolomites have been transgressed.

2. Taylor. The Taylor Group includes Ozan, Annona, Marlbrook and Saratoga formations.

a. Ozan. The Ozan formation may attain thicknesses of up to 150 feet in the southeast section of Jefferson County, although it may not be present in the northwest corner of the county. The Ozan is considered to be the basal formation of the Taylor Group in northeastern Arkansas (Caplan, 1954).

It varies from fossiliferous gray sandy marl, sand, sandy limestone and clay to chalk and marl. A glauconitic sand layer occurs at the base.

b. Annona. The Annona formation probably ranges from 0 to 85 feet in thickness in Jefferson County. Sedimentation may have occurred between the depositional periods of the Ozan and Annona formations. Caplan (1954) states:

> The Annona of this area is a medium to dark gray, finely micaceous, non-calcareous shale which may contain zones of light gray, calcareous, sparingly fossiliferous shale or marl. In places, glauconitic chalk and thin beds of calcareous fine-grained sandstones may be found within the formation. In well samples, the base of the Annona is generally found to be marked by a zone containing a considerable representation of free pyrite, glauconite and phosphatic nodules. This zone has its greatest value in permitting establishment of the lower limit of the "chalk section" in the embayment, since the Saratoga-Marlbrook-Annona sequence comprising the "chalk section" may otherwise not be separable within itself or from the underlying Ozan formation, where it is present. Although such a distinction among these formations may not appear to have commercial significance at this time, it is of value in helping to detail the stratigraphy of the area. A study of electrical logs in the embayment, in conjunction with sample work, indicates that the base of the Annona can be picked fairly accurately from electrical logs alone where no samples are available. The formation frequently contains iridescent shell fragments, Inoceramus prisms, and sharks teeth which may help to delimit it.

c. Marlbrook. The Marlbrook formation has been tentatively identified south and east of a line running through northwest Jefferson County. Its thickness in Jefferson County ranges from 0 to 150 feet. The Marlbrook is a fossiliferous chalky blue to gray marl containing some glauconitic sand and, locally, thin beds of chalk (Cushing et al., 1964). Phosphate nodules may also be present in this formation.

d. Saratoga. The Saratoga formation should be found overlying either the Marlbrook or Annona formations in Jefferson County; with thicknesses ranging from 0 to 125 feet. This formation is a white fossiliferous sandy chalk with a thin glauconitic and phosphatic zone at its uncomfortable contact with the underlying Marlbrook formation (Cushing et al., 1964). Thin-bedded limestones or sandstones may be present in the deeper layers.

3. Navarro. Two formations in the Navarro Group, the Nacatock and Arkadelphia, comprise the uppermost limits of the Upper Cretaceous series in Jefferson County.

a. Nacatock. Caplan (1954) offers this characterization of the Nacatock formation:

> ...this formation can generally be divided lithologically into three units in northeastern Arkansas. The upper and lower units are similar in appearance, both being essentially sandy clays, shales and marls. The latter unit, however, appears to contain relatively more marl than the former. The middle member of the formation is its most distinctive lithologic unit, being principally a light-gray to white, fossiliferous, calcareous phosphatic, glauconitic, poorly sorted sandstone. Light gray glauconitic, micaceous sandy marls may be present indiscriminately in this unit, in addition to thin-bedded, white, sandy crystalline limestone.

b. Arkadelphia. The Arkadelphia formation forms the uppermost boundary between the Upper Cretaceous System and the Tertiary System in Jefferson County. The Arkadelphia formation is generally about 50 feet thick throughout the embayment. The Arkadelphia formation is typically light to dark-gray, marly, fossiliferous shale which may be glauconitic and chalky in part. Frequently, a gray, micaceous shale is found in the basal portion of the Arkadelphia.

C. Cenozoic Era.

1. Tertiary Paleocene Epoch. The Paleocene Epoch includes the Midway Group which is comprised of the Clayton and Porters Creek formations. The top of the Midway Group is 1,500 feet below sea level in the northwestern part of Jefferson County and 3,000 feet below sea level in the extreme southeastern portion of the county. Caplan (1954) characterized the Midway Group:

> The Midway Group is made up of two members, an upper (Porters Creek) blue-gray to dark-gray, fissile, flakey shale, containing sideritic, concretionary layers, and a lower unit of soft, gray, calcareous, fossiliferous shale with lenses of white limestone near the base. Occasionally a glauconitic, phosphatic layer separates the lower Midway unit from the underlying Arkadelphia formation. The calcareous lower Midway unit (Clayton) ranges between 1 and 120 feet in thickness, averaging between 50 and 100 feet, in the embayment. It thickens abruptly, however, in the vicinity of the Ouachita Mountains and exceeds

the maximum thickness given here by several times. The upper shale member of the Midway is essentially non-calcareous and unfossiliferous, although a few arenaceous forams have been identified within it. The lower unit is identified by the appearance of calcareous material and highly fossiliferous zones.

2. Tertiary Eocene Epoch. The Eocene Series overlies the Midway Group in Jefferson County; this series is divided in ascending order into the Wilcox, Claiborne and Jackson groups. These groups are of marine and nonmarine origin in the embayment.

a. Wilcox Group. The Wilcox Group is the oldest of the Eocene Series in Jefferson County; an outcrop of this formation can be found nine miles west of the northwest corner of the county (Branner, 1929). About 11 miles north of Pine Bluff, it is approximately 750 feet thick, and its top is about 1,500 feet below the surface and 1,275 feet below sea level (Klein et al., 1950). The Wilcox is composed primarily of clay, sand, and silt and contains considerable lignite and some glauconite. This unit downdips toward the embayment axis about 50 feet per mile in Jefferson County. The Wilcox is probably a thick mass of deltaic sediments accumulated over a period of continental erosion (Klein et al., 1950). The sandy unit of the Wilcox in the northern part of the embayment is known as the "1,400-foot sand" in the Memphis area; it is an important aquifer in this region.

b. Claiborne Group.

(1) Carrizo Sand. The Carrizo Sand is the basal member of the Claiborne Group in Jefferson County; it unconformably overlies the Wilcox Group (Hosman et al., 1968). The Carrizo Sand dips southeastward across Jefferson County at a rate of 20-40 feet per mile. Thickness of this formation increases from less than 100 feet in the northwest segment of Jefferson County (about 20 miles from an outcrop of Carrizo Sand) to greater than 300 feet in that eastern portion of the county included in the Desha Basin. The Carrizo Sand consists of fine to coarse light gray to brownish gray micaceous sand.

(2) Cane River Formation. The Cane River formation overlies the Carrizo Sand and underlies the Sparta Sand formation. This formation ranges in thickness from about 150 feet in the northwestern part of the county to about 400 feet or more in the southeast section. Marine clay, sandy clay, marl and thin beds of fine sand are most predominant. The Cane River formation dips toward the embayment axis at 30-40 feet per mile in a northwest-southeast direction across Jefferson County.

(3) Sparta Sand. Overlying the Cane River formation in Jefferson County is the Sparta Sand, a white to light gray fine to medium-grained massive sand, with beds and lenses of light-gray to tan clay and sandy clay (Klein et al., 1950). The Sparta Sand in Jefferson County is comprised of about 20 per cent sand interstratified with silt, clay, shale and minor amounts of lignite (Hosman et al., 1968). The presence of glauconitic sands possibly is the result of reworking materials of older strata by fluviatile action (Klein et al., 1950). Indications are that the Sparta Sand is the result of continental erosion and subsequent deposition. Thicknesses vary considerably in the Jefferson County area; the formation ranges from 450-800 feet within relatively short distances. Several miles west of the northwestern corner of the county, the Sparta Sand outcrops, while in the southeast, it dips to approximately 900 feet below mean sea level. Sparta Sand is the most productive Tertiary aquifer in Jefferson County.

(4) Cook Mountain Formation. The upper part of the Claiborne Group in south-central Arkansas consists of the Cook Mountain and Cockfield formations. The Cook Mountain formation is less than 200 feet thick in Jefferson County and is composed of glauconitic, calcareous fossiliferous sandy marl or limestone in the lower lithologic unit and sandy carbonaceous clay or shale (locally glauconitic) in the upper unit (Cushing et al., 1964). Locally, the Cook Mountain contains clay and lenses of sand (Klein et al., 1950).

(5) Cockfield Formation. The uppermost formation in the Claiborne Group is the Cockfield formation; composition is chiefly lenticularly interbedded, fine to medium quartz sand and lignitic clay; the basal part of the formation is sandier (Broom and Reed, 1973). The Cockfield deepens in the southeast portion of Jefferson County as it dips towards the embayment. Thickness in the county is about 200 feet, although it may be more expansive in the more eastern portions of the county.

The Wilcox-Claiborne groups constitute a thickness of 2,000-3,000 feet in the Desha Basin (eastern Jefferson County). This profundity constitutes over half the total Tertiary deposition in this area (Wilbert, 1953).

c. Jackson Group. The undifferentiated Jackson Group is the uppermost unit in the Eocene Series; it is overlain in all Jefferson County by Mississippi River alluvial deposits except in a belt about five miles wide on the north and 16 miles on the south where outcropping occurs. The Jackson was formed during the last extensive marine invasion of the Mississippi embayment (Cushing

et al., 1964). It is comprised of relatively homogeneous clay, with some silt and sand beds. Thickness ranges from 100-300 feet, although in certain areas erosion may have further reduced the thickness of this formation.

SOIL ASSOCIATIONS

A. Amy-Pheba-Savannah Association. This poorly drained to moderately well drained association occurs in the west-central part of the county and encompasses portions of the City of Pine Bluff and the Pine Bluff Arsenal. It consists of broad flats intermixed with occasional small ridges. The Amy soils occur on the broad flats, the Pheba soils occur on the flats and lower edges of the ridges and the Savannah soils occur on the ridges (Larance et al., 1973). This association encompasses about 6.8 per cent of the county. Amy soils make up about 45 per cent of the association; Pheba soils, 25 per cent and Savannah, 20 per cent. The remaining per cent is composed of Myatt, Cahaba (Smithdale*), Angie (Sawyer*), Sacul and Ochlockonee (U.S. Department of Agriculture, 1969-73).

Amy soils are poorly drained. The gray silt loam surface soil overlays a gray, mottled silty clay loam. The Pheba soils are somewhat poorly drained. The surface soil consists of dark gray to grayish-brown silt loam, whereas, the subsoil is yellowish-brown to grayish-brown, mottled silt loam or loam. The lower portion of the subsoil is a mottled, firm and brittle silt loam fragipan. Savannah soils are moderately well drained. The surface soil is grayish-brown fine sandy loam. The upper subsoil is yellowish-brown loam or sandy clay loam and the lower subsoil is a gray and brown, mottled fragipan (U.S. Department of Agriculture, 1969-73).

Soils in this association are poorly suited for dwellings, other buildings or highways because of the seasonal high water table, wetness and low bearing strength. Slow percolation rate and seasonal high water table also make this association poorly suited for septic tank absorption fields (Larance et al., 1973). Although this association is suited to farming, most of the land outside of the Pine Bluff city limits is woodland.

B. Sawyer-Sacul-Savannah Association. This moderately well drained association occurs along the western portion of the county. It is located on nearly level to rolling uplands of the Coastal Plain (U.S. Department of Agriculture, 1971a).

*Cahaba has been changed to Smithdale and Angie to Sawyer as part of the new classification procedures being conducted by SCS. Hereafter, Cahaba soils and Angie soils will be referred to as Smithdale and Sawyer soils, respectively.

The Sawyer and Savannah soils are more prevalent in the nearly level areas, whereas, the Sacul soils predominate on the steep slopes (U.S. Department of Agriculture, 1968-73).

This large association encompasses about 20.3 per cent of the county. Sawyer soils make up about 35 per cent of the association; Sacul, 25 per cent; and Savannah, 25 per cent. The remaining portion is composed of Amy, Ochlockonee, Luka, Myatt, Smithdale, Susquehanna and Pheba soils (U.S. Department of Agriculture, 1969-73).

The moderately well-drained Sawyer soils have a grayish-brown fine sandy loam surface soil. The upper subsoil is yellowish-brown silty clay loam and covers a lower subsoil of yellow and gray, mottled silty clay or silty clay loam. Sacul soils are also moderately well drained. The surface soil consists of grayish-brown fine sandy loam and the subsurface soil is yellowish-red and red clay and is mottled gray in the lower portion. The moderately well drained Savannah soils have a surface layer of grayish-brown fine sandy loam. The subsoil is yellowish-brown loam or sandy clay loam in the upper portion with a gray, yellow and brown mottled fragipan in the lower part (U.S. Department of Agriculture, 1969-73).

Soils in this association are poorly suited for highways, septic tank absorption fields and dwellings because of low strength, high shrink-swell potential, slow percolation rate and slopes. Forest and pasture types of vegetation are predominant in the sloping upland areas (U.S. Department of Agriculture, 1969-73).

C. <u>Smithdale-Savannah Association</u>. This well and moderately well drained association occurs in four patchy locations in the western portion of the county. Smithdale soils predominate on the upper ridges, whereas, Savannah soils occur on the level and slighly elevated areas. This association encompasses about 4.2 per cent of the county. Smithdale soils comprise about 45 per cent of the association and Savannah soils make up about 40 per cent. The remaining portion is composed of Sawyer, Amy, Pheba and Sacul soils (U.S. Department of Agriculture, 1969-73).

Smithdale soils are well drained. The surface layer is brownish sandy loam, whereas, the upper subsoil is yellowish-red or red sandy clay loam and the lower subsoil is loam or sandy loam. Savannah soils are moderately well drained. These soils have a dark grayish-brown fine sandy loam surface layer and a yellowish-brown loam subsoil. A thick brittle, mottled yellowish-brown, gray and red fragipan lies below the lower subsoil (U.S. Department of Agriculture, 1969-73).

This association is suited for dwellings, other buildings and foundations for highways except where slopes are prohibitive (Larance et al., 1973). Although Smithdale soils are suited for septic tank absorption fields, Savannah soils are poorly suited because of their slow percolation rate and moderately slow permeability. Soils in this association are suited for agriculture but require careful management. Most areas are forested with pines (U.S. Department of Agriculture, 1969-73).

D. Crevasse-Portland Association. This excessively and somewhat poorly drained association occurs within the floodplain of the Arkansas River and somewhat parallels the river diagonally across the county from northwest to southeast. This association encompasses about 9.2 per cent of the county. Crevasse soils make up about 45 per cent of the association and Portland soils make up 30 per cent. The remaining per cent of the association is composed of Rilla, Keo (Coushatta*), Morganfield, Latanier, Desha and Perry soils (U.S. Department of Agriculture, 1969-73).

Crevasse soils are excessively drained. The brown loamy sand of the surface soils overlays light yellowish-brown sand. Portland soils are somewhat poorly drained. The surface layer is dark grayish-brown silty clay loam to clay and the subsoil consists of dark brown to red, mottled clay (U.S. Department of Agriculture, 1969-73).

Soils in this association are poorly suited for dwellings, other buildings and highways because of flood hazard in unprotected areas, low strength, high shrink-swell potential and wetness. These soils are also poorly suited for septic tank absorption fields because of percolation rates, wetness and flood potential (U.S. Department of Agriculture, 1969-73).

Crevasse soils protected from flooding are cleared and planted in pasture and hay. Forest plants consist of cottonwood, elm, hackberry, pecan, sycamore and willow. Most Portland soils are cleared and cultivated for soybeans, cotton and rice. Prior to clearing, vegetation consisted of baldcypress, sweetgum, water tupelo, oaks, hackberry and hawthorne (U.S. Department of Agriculture, 1969-73).

E. Henry-Calloway-Grenada Association. This poorly to moderately well drained association occurs primarily in a narrow strip from central to south-central Jefferson County with a small section occurring in the south-central portion of the county. Most of this association occurs within the city limits of

*Keo has been changed to Coushatta as part of the new soil classification procedures being conducted by SCS. Hereafter, Keo soils will be referred to as Coushatta.

Pine Bluff and the boundary of the Pine Bluff Arsenal. This association encompasses about 3.7 per cent of the county. Henry soils make up about 40 per cent and Grenada soils, 15 per cent. The remaining portion of the association is composed of Falaya and Zachary soils and gullied land (U.S. Department of Agriculture, 1969-73).

Henry soils are poorly drained. The surface soil is grayish-brown or gray silt loam and the subsoil is gray, mottled silt loam or silty clay loam with a fragipan. Calloway soils are somewhat poorly drained. The surface soil is grayish-brown silt loam and the subsoil is grayish-brown and yellowish-brown, mottled silt loam or silty clay loam with a fragipan. Grenada soils are moderately well drained. The surface soil is brown silt loam and the subsoil is yellowish-brown silt loam or silty clay loam in the upper portion and mottled gray and yellowish-brown with a fragipan in the lower subsoil (U.S. Department of Agriculture, 1969-73).

Henry and Calloway soils are poorly suited as sites for residential development and as a foundation for highways, whereas, Grenada soils are fairly well suited (Cloutier and Fingers, 1966). Land-use limitations for Henry and Calloway soils are created by wetness and poor traffic supporting capacity. These soils have poor to moderate suitability for septic tank absorption fields. The principal soils in this association are suited for the cultivation of cotton, corn, soybeans and pasture. Wooded species are mostly mixed hardwoods (U.S. Department of Agriculture, 1969-73).

F. Morganfield-Coushatta-Rilla Association. This well drained association occurs in central Jefferson County parallel to the Arkansas River. It is nearly level to very gently sloping. This association encompasses about 7.0 per cent of the county. Morganfield soils comprise about 35 per cent of the association; Coushatta, 25 per cent; and Rilla, 25 per cent. The remaining portion of the association is composed of Hebert, Latanier, McGehee and Portland soils (U.S. Department of Agriculture, 1969-73).

The well drained Morganfield soils have a grayish-brown or brown fine sandy loam surface soil. The subsoil is brown or strong brown silt loam or loam. Coushatta soils are also well drained. They have a reddish-brown silt loam surface layer and a reddish-brown silty clay loam or silt loam subsoil. The well drained Rilla soils have a grayish-brown or brown silt loam or fine sandy loam surface soil. The subsoil is yellowish-red loam or silty clay loam (U.S. Department of Agriculture, 1969-73).

The principal soils composing this association are well suited for cultivation of cotton, corn, soybeans, small grains and pastures. Native vegetation was mixed hardwoods (U.S. Department of Agriculture, 1969-73).

Soils are moderately to poorly suited for dwellings, other buildings and highways because of potential flood hazards, wetness, low strength and high shrink-swell potential. However, under flood protected conditions Morganfield and Coushatta soils are well suited for the above mentioned purposes. Suitability for septic tank absorption fields is moderate in protected areas (U.S. Department of Agriculture, 1969-73).

G. Perry-Portland Association. This somewhat poorly drained association predominates in the northeast corner of the county but smaller areas are found throughout the eastern half of the county along slackwater flats and sluggish bayous and sloughs. This large association encompasses about 26.0 per cent of the county. Perry soils make up about 45 per cent of the association and Portland soils make up 40 per cent. The remaining portion consists of Latanier, Desha, Hebert, Rilla and Lonoke soils (U.S. Department of Agriculture, 1969-73).

The poorly drained Perry soils have a dark grayish-brown, mottled clay surface layer. The subsoil has a gray, mottled clay upper region and a reddish-brown clay lower region. The somewhat poorly drained Portland soils have a dark brown clay or silt loam surface layer. The upper portion of the subsoil is brown, mottled clay and the lower portion is reddish-brown clay (Larance *et al.*, 1973).

The soils in this association have severe limitations for use as residential sites or as a foundation for roads because of their wetness, instability and low bearing strength. They are also poorly suited for septic tank absorption fields because of wetness and slow percolation rate (Larance *et al.*, 1973). This association is well suited to rice, cotton, soybeans and pasture (Cloutier and Fingers, 1966). Native vegetation consisted of water tolerant oaks, cottonwood, sweetgum and sycamore (U.S. Department of Agriculture, 1969-73).

H. Rilla-Lonoke-Hebert Association. This well and somewhat poorly drained association occurs primarily in north-central Jefferson County. Smaller areas are located in the south-central and extreme eastern portions of the county. These nearly level to gently rolling soils developed primarily from Arkansas River alluvium. This association encompasses about 21.7 per cent of the county. Rilla soils make up about 35 per cent of the association; Lonoke soils,

30 per cent and Hebert soils, 20 per cent. The remaining portion is composed of Perry, Portland, McGehee, Coushatta, Morganfield and Latanier soils (U.S. Department of Agriculture, 1969-73).

Rilla soils are well drained. The surface soil is grayish-brown or brown silt loam or fine sandy loam and the subsoil is yellowish-red silt loam or silty clay loam. Lonoke soils are also well drained. The surface soil is dark brown silt loam and the subsoil is reddish-brown loam to fine sand loam. Hebert soils are somewhat poorly drained. The surface soil is grayish-brown or brown silt loam and the subsoil is grayish-brown to reddish-brown, mottled clay loam to silty clay loam (U.S. Department of Agriculture, 1969-73).

The soils in this association are suited for dwellings, other buildings and highways. These soils are not, however, suited for septic tank absorption fields because of slow percolation rate and wetness. The soils in this association are suited for cultivation of cotton, soybeans, corn and pasture. Prior to agricultural cultivation, these soils were forested primarily by bottomland hardwoods (U.S. Department of Agriculture, 1969-73).

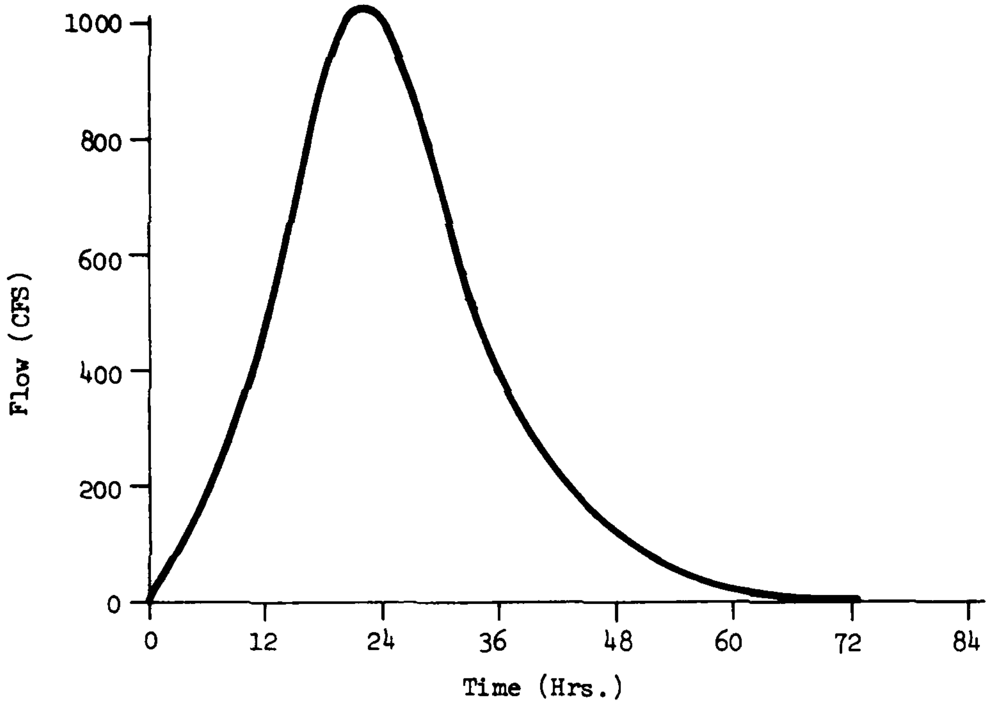


Figure A-1: Unit Hydrograph - Station 7 (Caney Bayou at Wooden Bridge on Jones Road)

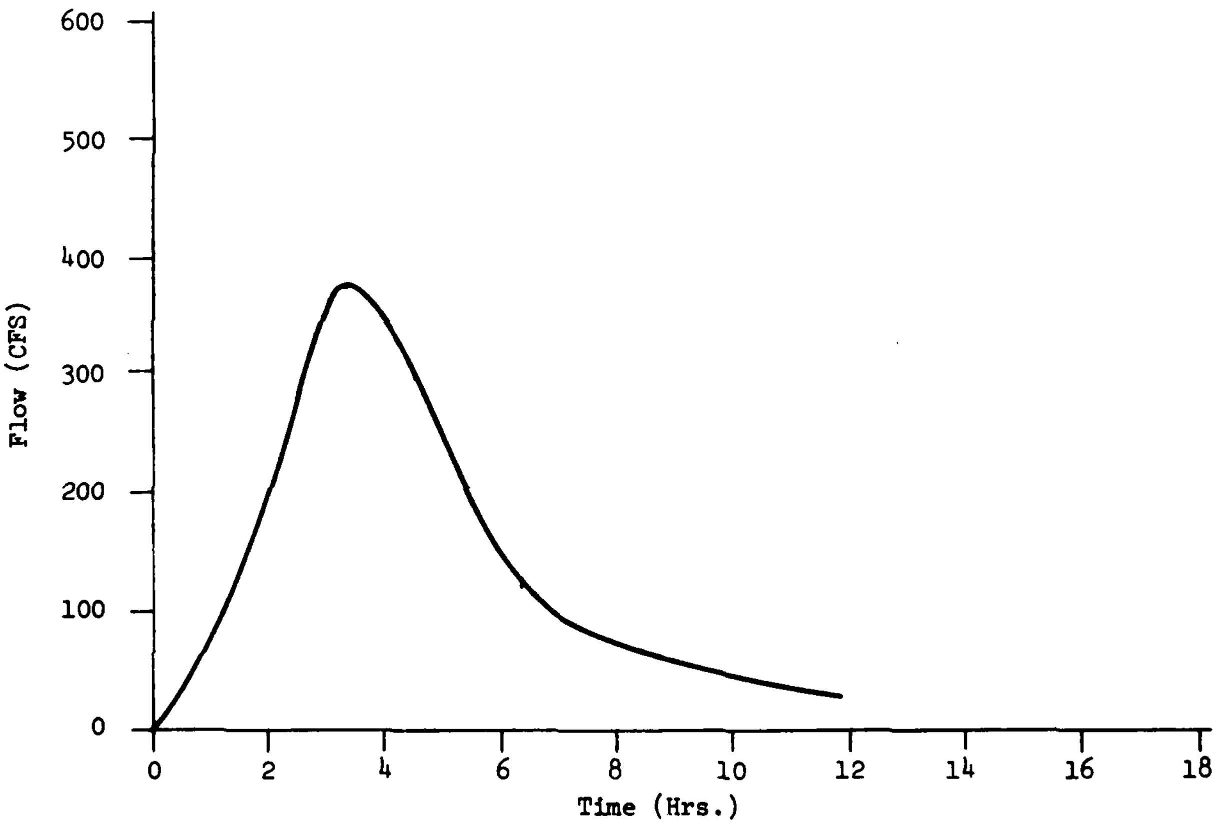


Figure A-2: Unit Hydrogragh - Station 8 (Brumps Bayou at Highway 65)

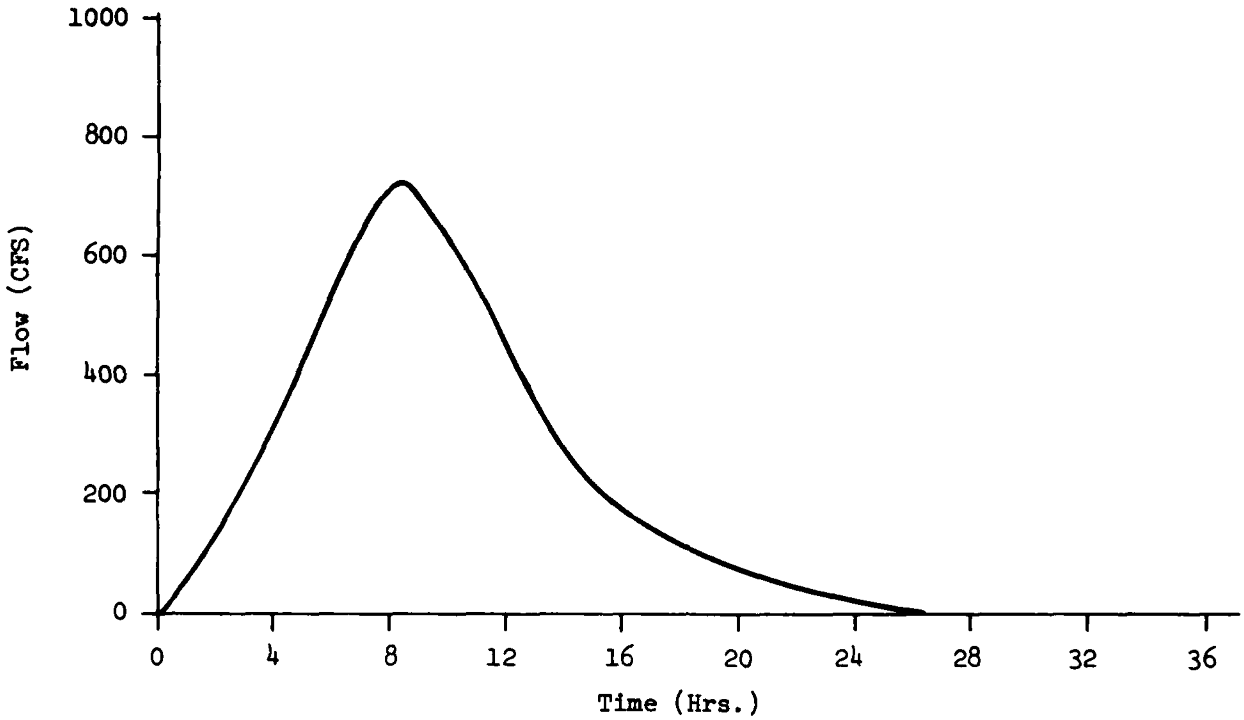


Figure A-3: Unit Hydrograph - Station 1 (Bayou Bartholomew at Princeton Pike Road)

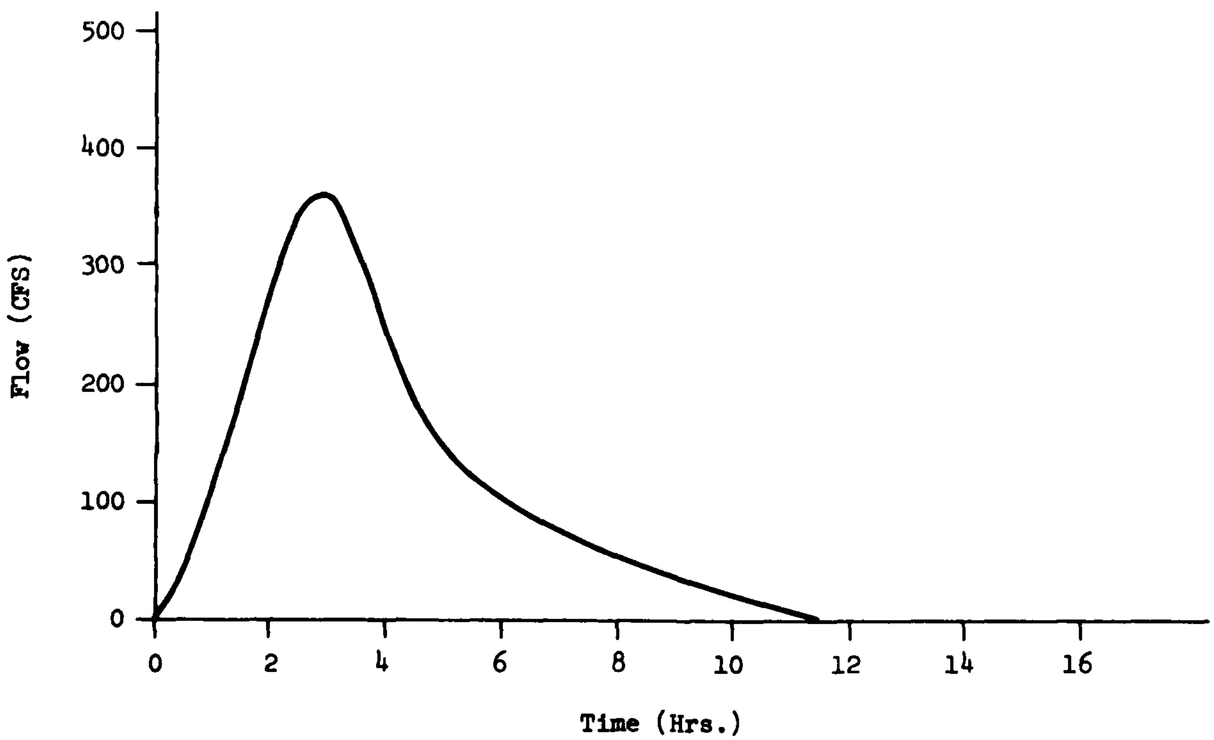


Figure A-4: Unit Hydrograph - Station 2 (Interceptor Canal at 34th Street)

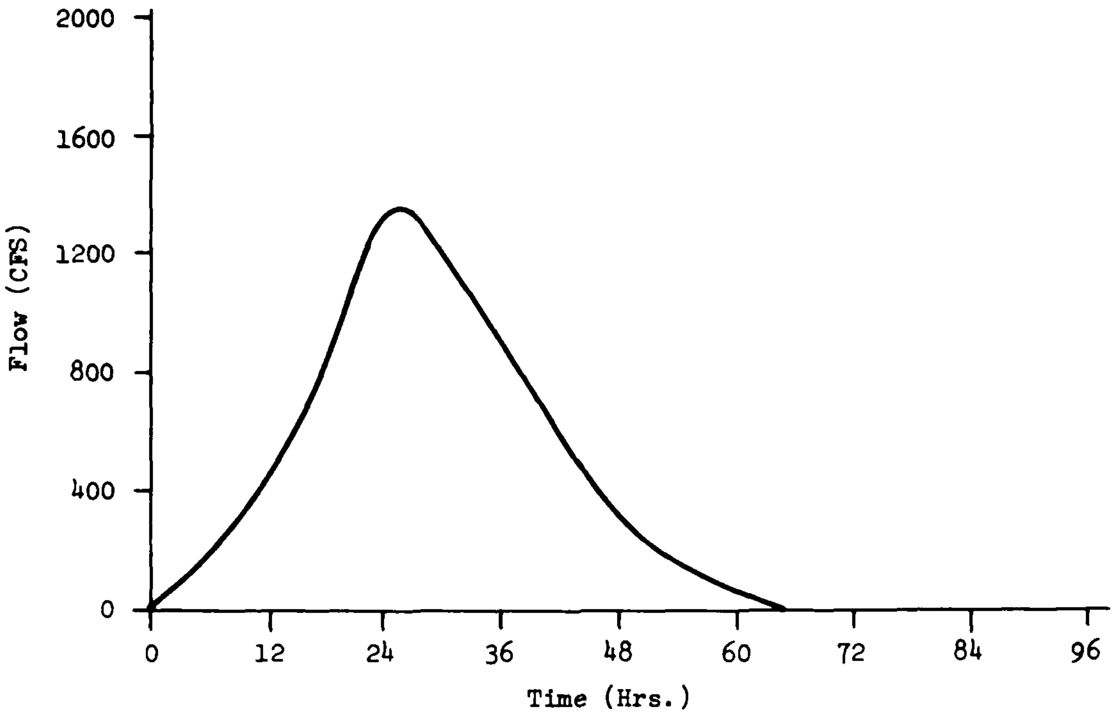


Figure A-5: Unit Hydrograph - Station 3 (Bayou Bartholomew at Highway 15)

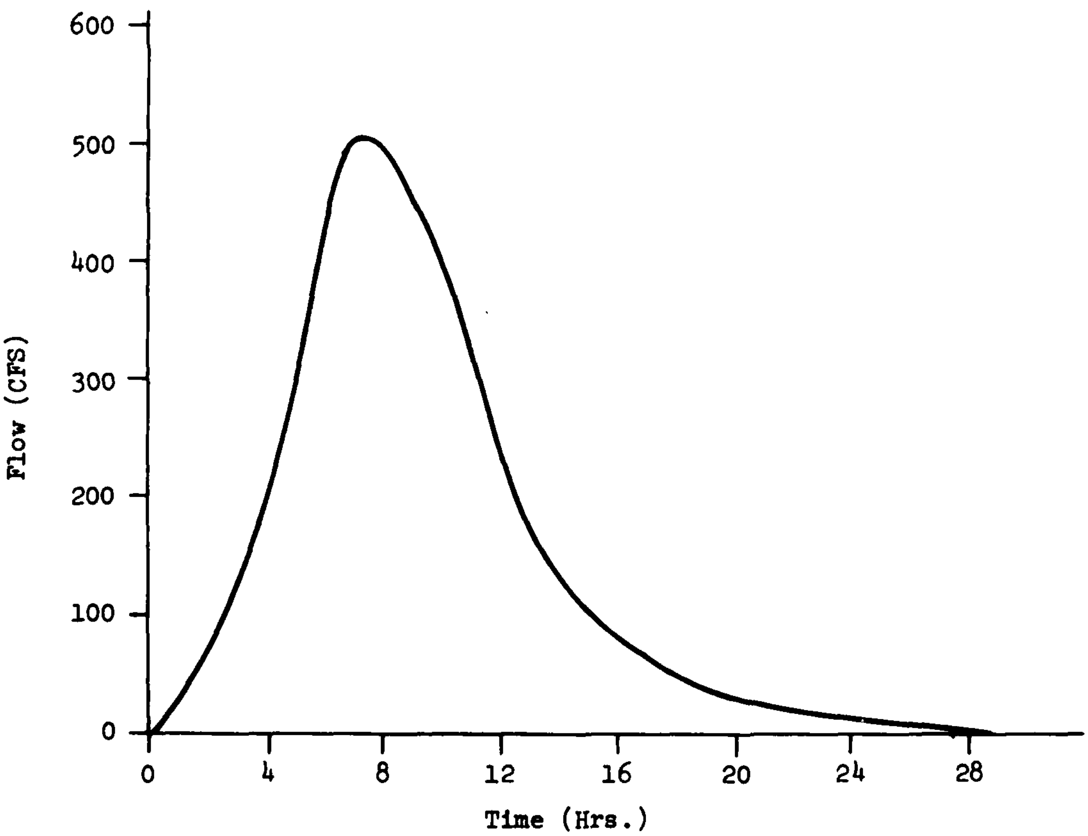


Figure A-6: Unit Hydrograph - Station 4 (Outlet Canal at 38th Street)

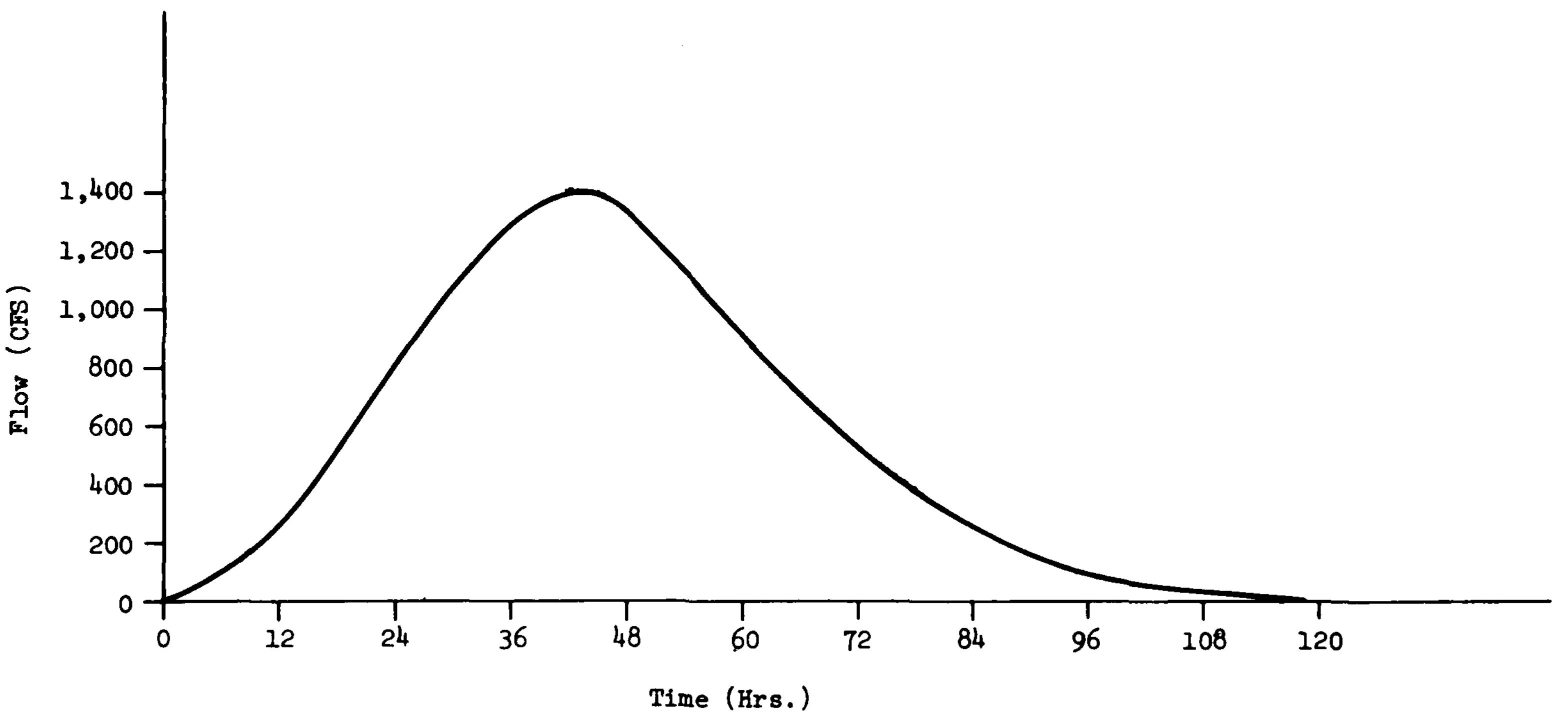


Figure A-7: Unit Hydrograph - Station 5 (Bayou Bartholomew at Pinebergen)

Appendix B

Land Use

METHODOLOGY FOR FUNCTIONAL LAND USE PROJECTIONS

A. Assumptions were based upon Series E population projections: OBERS, 1972. Population of the specific study area was calculated and used; Jefferson County figures were not employed.

B. The land use data presented in the PBAMWMS was amended as suggested by the Southeast Arkansas Regional Planning Commission and used as baseline data.

ASSUMPTIONS

A. Residential density factors of 18 people per acre in urban areas and 15 people per acre in rural areas were used in forecasting residential areas. Typical lot sizes, housing trends, and family sizes were considered in this factor.

B. Commercial areas were calculated on a per capita basis and primary consideration was given to "new" areas.

C. Public areas will include recreational facilities as planned and a given per capita area for institutional uses. Projections for 2000 and 2020 include standard criteria for optimum development of recreational facilities (Dechiara and Koppelman, 1969).

D. Semi-public areas were calculated by using a decreasing per capita ratio through the year 2020. The established ratio for 1974 is .0085 acres per capita and those used for 1985, 2000 and 2020 were .0081, .0078 and .0075, respectively. The decreasing factor was used to take into account a "fixed allotment" commonly associated with such facilities.

E. Transportation, communications and utilities were calculated upon the net expansion of urban areas.

F. The industrial areas shown in 1974 are sufficient to accommodate a population twice as large as that of Pine Bluff. Small figures were added in 1985 and 2000 in an effort to accommodate miscellaneous development.

G. The Pine Bluff Arsenal and its related uses and the major water areas were held constant throughout the year 2020.

H. Agricultural and forest lands were calculated based on current patterns and a projection of the amount of land required for future urban-type development.

I. Acreage for new transportation corridors was calculated based upon the expansion of U.S. Highway 65 in the Study Area for 1985, and the construction of the Bayou Bartholomew Expressway and the relocation of major rail corridors for

the year 2000. Due to the fact that these projects are outside of the urban area and are not necessary to accommodate the projected growth, they were classified separately from other transportation corridors (transportation, communications and utilities).

Appendix C

Water Quality

COLLECTION AND ANALYSIS METHODS

A. Baseflow Water Sampling. Water quality determinations were performed twice monthly at stream and canal stations 1, 2, 3, 4, 5, 6, 7, 8a and 8b, while lake stations 9a, 9b, 10a, 10b and 10c were monitored monthly.

No deviations were made in relation to station sampling order. Beginning at Station 6, the order of sampling continued with samplings at stations 7, 8a, 8b, 1, 2, 3, 4 and 5. On lake sampling dates, the above order again received successive attention after Station 5.

Field observations were made on meterological conditions plus stream, canal and lake physical characteristics; i.e., rate of flow, algal blooms, presence of film layers and stream water levels. Height of the stream and canal water columns for discharge determinations were noted on both staff and stage recorder gages.

At stream and canal stations, water samples were taken with 3-gallon plastic buckets and held in six (6) ounce polyethylene Whirl-pac bags and one (1) liter polyethylene bottles. Samples taken in lakes were secured at mid-depth with a bottle train sampler. After field analysis, samples were refrigerated and taken to Ouachita Baptist University Chemistry Department in Arkadelphia, Arkansas, for laboratory analysis. Number, name and location of the water quality sampling stations by river basin hydrologic system follow:

THE ARKANSAS RIVER BASIN

The Caney Bayou System		
Station 6	Upper Caney	Caney Bayou at Highway 65
Station 7*	Lower Caney	Caney Bayou at wooden bridge above Lake Pine Bluff at Jones Road
The Brumps Bayou System		
Station 8a *	Brumps	Brumps Bayou at U.S. Highway 65
Station 8b*	Brumps Confluence	Brumps Bayou tributary below Bellewood Cemetary
Station 9a	Lake Pine Bluff	At mouth of Brumps Bayou
Station 9b	Lake Pine Bluff	Eastern edge of lake
The Arkansas River System		
Station 10a	Lake Langhofer	Near levee close to eastern shoreline

*Also monitored for stormwater quality.

The Arkansas River System (continued)

Station 10b	Lake Langhofer	Opposite Boyd Point
Station 10c	Lake Langhofer	Opposite Island Harbor Marina

THE OUACHITA RIVER BASIN

The Bartholomew System

Station 1*	Princeton Pike	Bayou Bartholomew at Princeton Pike Road
Station 2*	Interceptor	Interceptor Canal at 34th Street
Station 3*	Highway 15	Bayou Bartholomew at Highway 15
Station 4*	Outlet	Outlet Canal at 38th Street
Station 5*	Pineburgen	Bayou Bartholomew at the Jefferson-Lincoln County Line Road

B. Stormwater Sampling. Collection procedures for stormwater quality were similar to those used in baseflow water sampling, except that sampling succession was enacted within stations as opposed to among stations in baseflow water sampling. Baseline samples were secured before rainfall during all storms except for May 14-15, 1974, when a combination of a rapidly approaching storm and procedural difficulties precluded such samples. Parameters such as pH, alkalinity, dissolved oxygen and specific conductance were measured in a laboratory within two (2) hours of collecting, rather than completed under adverse field conditions. Elapsed time within station collections varied according to type station, storm intensity and sampling time. Because stations 1, 2, 4 and 8a had small drainage areas, elapsed time between samplings were much shorter than large-drainage stations 3, 5 and 7. Storms of high intensity and short duration required more frequent sampling than low intensity, long duration storms; elapsed time between samples for low intensity storms was generally double that of high intensity storms. Within storm periods, elapsed time between samples increased by a factor of 2 to 4x toward sampling completion.

C. Non-Periodic Sampling.

1. Water and Mud. Water and mud samples for heavy metals (exlcluding those taken during stormwater quality) and pesticides were all taken on July 18, 1974. All samples were secured in six (6) ounce polyethylene Whirl-pac bags or one (1) liter polyethylene bottles, refrigerated to 4°C and delivered to

either Ouachita Baptist University or Barrow-Agee Laboratories for analysis; no preservatives were added to the samples.

2. Tissues.

a. Fishes. Fishes were obtained by seining, rotenone or hook and line, then frozen in Whirl-pac bags. Because more than one specimen of each species was gathered at each station, individuals within each species were cut into four sections and mixed. Samples were then subdivided into two equivalent aliquots, one each for Ouachita Baptist University and Barrow-Agee Laboratories.

b. Birds and Mammals. All raccoons taken in the Study Area were killed with a .22 caliber rifle. Individual specimen livers were then frozen whole in Whirl-pac bags. Later the samples were halved and sent to Ouachita Baptist University and Barrow-Agee Laboratories for analysis. Barred owls which had been injured near stations 1 and 3, and screech owls killed with a .22 caliber rifle at the remaining stations were eviscerated for liver samples. After freezing in Whirl-pac bags, samples were halved and sent to the above laboratories for analysis. Raccoons were determined for sex, age and weight; owls were weighed and determined as adult or immature.

D. Water Quality Methods.

1. In Situ (Field).

a. pH. Beckman Chemate Meter.

b. Dissolved Oxygen. YSI Model 54RC Dissolved Oxygen Meter.

c. Water Temperature. YSI Model 54RC Dissolved Oxygen Meter.

d. Specific Conductance. YSI Conductivity Meter.

e. Free Carbon Dioxide. Titrimetric method as described in American Public Health Association (1971).

f. Total Alkalinity. Potentiometric method as described in American Public Health Association (1971).

g. Transparency. Measured by a ten (10) centimeter black and white Secchi disk in shade, where possible.

h. Dissolved Oxygen and Temperature Profiles (Lakes). Readings taken at one meter intervals with YSI Model 54RC Dissolved Oxygen Meter.

2. Laboratory.

a. Turbidity. From March 12-July 25, Hach DR II Spectrophotometer; after July 25, Jackson Turbidimeter.

b. Color (True). From March 12-July 25, Hach DR II Spectrophotometer; after July 15, Curtin Matheson Water Analyser and Color Slide. Samples were centrifuged prior to analysis.

c. Biochemical Oxygen Demand. As described in American Public Health Association (1971).

d. Chemical Oxygen Demand. Samples preserved with 0.2 ml concentrated H_2SO_4/100 ml, then analysed as described in American Public Health Association (1971) with the modification that excess chromate was determined spectrophotometrically rather than t titration.

e. Total Hardness. EDTA titrimetric method as described by American Public Health Association (1971).

f. Calcium Hardness. Calcium as determined by atomic absorption spectroscopy; hardness then calculated as described in American Public Health Association (1971).

g. Oil and Grease. Samples were taken on surface and acidified to pH 3; analysed as described in American Public Health Association (1971) using Freon as an extracting agent.

h. Nitrite Nitrogen. Spectrophotometric method as described in American Public Health Association (1971).

i. Nitrate Nitrogen. Ultraviolet spectrophotometric method as described in American Public Health Association (1971).

j. Ammonia Nitrogen. Orion specific ion electrode at conditions recommended by manufacturer.

k. Total Kjeldahl Nitrogen. Digestion as described in American Public Health Association (1971), followed by direct determination of ammonia using methods described in j.

l. Total Phosphorus. Persulfate digestion followed by ascorbic acid method as described in American Public Health Association (1971).

m. Total, Fecal Coliform and Fecal Streptococcus Bacteria. Membrane filter technique as described in American Public Health Association (1971).

n. Total Solids. Raw water samples evaporated to dryness and placed in oven at 180°C as described in American Public Health Association (1971).

o. Suspended Solids. Raw water sample filtered through a glass fiber filter, then filtrate evaporated and treated in the same manner as n.

p. Volatile Solids. Residue remaining from total solids determination was fired at 550°C as described in American Public Health Association (1971).

q. Lead, Zinc, Silver, Chromium, Copper, Cadmium, Iron, Manganese, Cobalt and Nickel. Samples fixed in field with 8 drops concentrated HCl/ 100 ml sample.

(1) Mud and Tissues. Digestion with concentrated nitric acid, then atomic absorption spectroscopy at conditions recommended by manufacturer (Perkin Elmer Corporation).

(2) Water. Atomic absorption spectroscopy at conditions recommended by manufacturer (Perkin Elmer Corporation).

r. Arsenic. Silver diethyldithiocarbamate method as described in American Public Health Association (1971).

s. Aluminum. Erichrome Cyanine R method as described in American Public Health Association (1971).

t. Mercury. Samples fixed with eight (8) drops $KMnO_4$/100 ml sample, then analysed by flameless atomic absorption method.

u. Boron. Curcumin method as described in American Public Health Association (1971).

v. Cyanide. Orion specific ion electrode at conditions recommended by manufacturer.

w. Phenols. Direct photometric method as described in American Public Health Association (1971).

x. Sulfate. As described in American Public Health Association (1971).

y. Chlorides. As described in American Public Health Association (1971).

z. Barium, Selenium, Beryllium, Antimony, Molybdenum, Thallium, Tin and Titanium. Samples evaporated, acidified and analysed with a Jarrel-Ash atomic absorption unit.

z'. Lindane, DDE, Endrin, Aldrin, DDD, Chlordane, Heptachlor, DDT, Methyoxychlor, Heptachlor Epoxide, Dieldrin, Endosulfan, Methyl Parathion, Toxaphene and Polychlorinated Biphenyls. Electron capture gas chromatography.

E. Stormwater Load Diagram Methods. Steps required for the determination of loadings during the 25-26 July, 1974 storm at stations 2, 4 and 8a are presented below:

1. Stage readings at sampling times were converted to cubic feet per second (cfs) with the use of established stage-discharge relationship curves from stations 2 and 4; Station 8a data was converted from direct discharge readings. Curves were filled in during sudden stage increases or decreases by extrapolating additional discharge readings from stage recorder charts. A series of discharge readings was than established at varying intervals for each station.

2. Discharge in total cubic feet between real and extrapolated sampling times was calculated by multiplying cfs times the number of seconds between points.

3. Known sampling concentrations and extrapolated concentrations were established in correlation with discharge points on the hydrograph. Number of pounds of a given parameter per cubic foot of water in a given time period were calculated as equivalents of mg/l and expressed as 0.0000624 lb/ft^3.

4. Total loadings were calculated as the sum of the pounds of parameter/ cubic feet of water discharged during the various time intervals.

5. Load diagrams were plotted and are presented in Figures C-36 through C-59.

F. Stormwater Runoff Load Analysis. The following information was available for developing load-frequency curves for storm runoff in the Pine Bluff area:

1. Measured concentrations of various parameters for various storm events covering portions of the storms at seven stations.

2. A-35 stage charts for most of the storms.

3. Stage-Discharge curves for most of stations monitored.

4. Measured discharge for some of the storms at some of the stations.

5. Volume-frequency relationships.

Using the A-35 charts, stage-discharge curves, and measured discharges, hydrographs were developed which were assigned frequencies from the volume-frequency relationships. Most of the frequencies were less than three months with the exception of the Lower Caney Station which had one storm with a frequency of 2.5 years.

Total loads of the various parameters for particular storms were developed on a "weighted average" basis. A concentration at a particular point in time was weighted according to the estimated or measured discharge at that point in time to develop a "weighted average" for the total storm event. This "weighted average" was multiplied by the total volume under the hydrograph for the storm to get total load. This total load was assigned the same frequency as was developed for the estimated volume.

Next these observed total loads were plotted verses frequency. Several methods were tried to extrapolate this data to the 10-year frequency (most of the storms monitored were in the two to three month range or less). The method finally used to arrive at average annual loads is described as follows:

1. The observed points were extrapolated to the 0.25 year frequency as a straight line (it was assumed that concentrations would stay the same in this range).

2. The curve was extended to other frequencies based on the concentration dropping one-half for each succeeding time period. For

the Lower Caney Station, the curves were extended from observed data points since data on a 2.5-year frequency storm was available.

After average annual loads were calculated for each station, these data were used as the base year (1974). Future stormwater quality was then projected as per cent change for the years 1985, 2000 and 2020 and quantified from base load data.

G. Quality Control Program. Environmental Protection Agency (EPA) reference samples were tested for nutrients, minerals, oxygen demands, trace metals and pesticides throughout the course of the study. The purpose of this quality control program was to insure accurate results in all phases of water quality testing by aiding the analysis laboratory in rectifying any detection difficulties. When EPA reference sample inaccuracies were noted, the involved laboratory was notified immediately and steps were taken to correct the problem.

Table C-1
BASEFLOW WATER QUALITY DATA

pH

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	5.8	7.4	6.3	6.7	6.2	6.4	6.5	7.1					
Mar. 26	6.3	7.5	6.5	7.2	6.6	6.9	6.7	7.2	7.4	7.1	8.0	8.3	9.2
Apr. 11	5.7	7.6	6.4	7.5	6.6	5.9	6.4	6.5					
Apr. 25	6.1	6.9	6.2	6.4	6.1	6.3	6.3	6.7	7.9	7.7	8.0	7.9	8.0
May 9	6.0	7.1	6.3	6.8	6.5	6.3	6.6	7.1					
May 23	6.0	7.3	6.6	6.6	6.3	6.5	6.5	7.1	8.9	7.9	8.3	7.5	7.7
SUMMER													
Jun. 6	6.3	7.0	6.2	6.5	6.3	6.8	6.5	7.2					
Jun. 20	6.2	7.3	6.4	7.1	6.8	6.5	6.6	7.1	8.4	8.6	7.9	6.9	7.3
Jul. 11	6.6	7.9	6.9	7.1	7.6	6.8	7.1	7.5					
Jul. 26	6.9	7.4	6.9	6.9	6.9	7.1	6.9	7.3	7.2	7.7	8.7	7.5	7.8
Aug. 8	6.3	7.3	6.2	6.5	6.3	6.7	6.8	7.1					
Aug. 22	6.7	7.2	7.0	7.1	7.1	6.7	6.8	7.2	7.3	8.0	9.2	8.1	7.8
FALL													
Sep. 5	6.0	7.4	6.1	6.9	6.3	6.3	6.7	7.2					
Sep. 17	6.0	7.3	5.6	6.2	5.8	6.5	6.7	7.1	9.1	8.6	9.3	8.6	7.9
Oct. 3	5.9	7.5	6.4	-	6.5	6.4	6.7	7.0					
Oct. 17	6.2	7.6	6.5	6.8	6.8	6.7	6.8	7.1	7.9	8.0	8.2	7.8	7.8
Nov. 7	6.1	7.6	6.3	6.9	6.5	5.9	6.4	7.0					
Nov. 21	6.1	7.5	6.4	6.9	6.8	6.0	6.6	6.8	7.2	7.5	8.2	7.5	7.4
WINTER													
Dec. 12	6.2	7.5	6.2	6.9	6.6	6.6	6.9	7.2					
Dec. 26	6.7	6.9	6.7	7.0	6.6	6.8	6.3	7.2	NS	6.8	7.1	7.0	7.4
Jan. 9	6.2	7.7	6.3	7.0	6.5	6.9	6.7	7.2					
Jan. 23	6.8	7.3	6.6	7.2	6.8	6.9	6.4	7.3	7.5	7.3	7.6	7.6	7.6
Feb. 6	6.0	7.8	6.6	7.2	6.7	6.4	6.5	7.4					
Feb. 20	6.7	7.3	6.6	6.6	6.5	6.9	6.8	7.3	7.5	7.2	8.5	7.5	7.6
MEAN	6.2	7.4	6.4	6.9	6.6	6.6	6.6	7.1	7.8	7.7	8.3	7.7	7.8
RANGE	5.7-6.9	6.9-7.9	5.6-7.0	6.2-7.5	5.8-7.6	5.9-7.1	6.3-7.1	6.5-7.5	7.2-9.1	6.8-8.6	7.1-9.3	6.9-8.6	7.3-9.2

Table C-2
BASEFLOW WATER QUALITY DATA
Alkalinity (mg/l $CaCO_3$)

SAMPLING DATE	STATION NUMBER 1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	6.5	5.7	5.0	56.5	15.0	4.5	4.0	51					
Mar. 26	4.0	59.5	8	57.5	18.5	5.2	20	62.5	49	48	80	90	83
Apr. 11	7	57.5	13.5	100.5	19	7.5	32	73					
Apr. 25	4	26.5	4.5	21	6	5	8	48	46	47	79.5	60	79
May 9	7	62	14.5	72	21.5	8.5	29	60					
May 23	3.5	58.5	11	50	20	7	18	59	47	46.5	70	65.5	83
SUMMER													
Jun. 6	6	30.5	6	32	15	8	15	65					
Jun. 20	9	59	15	60	35	21	32	86	41	42	50	56	53
Jul. 11	28	65	28	131	60	27	65	83					
Jul. 26	44	64	30	99	49	30	71	71	67	93	69	73	87
Aug. 8	23	52	19	69	26	23	59	77					
Aug. 22	29	56	33	54	44	28	55	78	68	127	64	79	101
FALL													
Sep. 5	4	40	9	34	10	3	37	101					
Sep. 17	7	46	5	36	12	13	34	94	50	59	68	83	121
Oct. 3	6	70	88	95	15	20	48	84					
Oct. 17	19	-	21	50	18	21	56	82	72	68	90	86	76
Nov. 7	6	56	10	76	29	7.0	24	88					
Nov. 21	5	49	8	69	25	6	30	66	55	61	90	81	68
WINTER													
Dec. 12	10	73	5	32	14	6	20	55					
Dec. 26	5	22	8	24	16	2	12	55	NS	55	87	76	66
Jan. 9	4	66	10	124	13	9	21	93					
Jan. 23	19	59	11	110	19	9	15	59	65	63	75	74	75
Feb. 6	9	57	6	48	17	10	13	77					
Feb. 20	10	60	15	93	14	14	15	87	57	58	79	77	74
MEAN	12	54	16	66	22	12	31	73	56	64	75	75	81
RANGE	3.5-44	22-70	5-88	21-131	6-60	2-30	4-71	48-101	41-72	42-127	50-90	56-90	53-121

Table C-3
BASEFLOW WATER QUALITY DATA
Water Temperature (^{o}C)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	17.3	24.9	18.9	19.0	20.0	16.0	17.5	18.2					
Mar. 26	12.0	23.0	10.9	11.5	11.6	8.2	10.3	13.1					
Apr. 11	14.1	19.7	16.5	17.1	17.6	14.0	15.0	18.0					
Apr. 25	13.1	16.6	16.1	17.5	18.0	13.5	15.8	18.0					
May 9	17.4	23.0	20.0	22.0	22.5	17.6	20.0	23.2					
May 23	19.2	23.5	21.5	22.8	23.8	19.0	21.2	24.1					
SUMMER													
Jun. 6	20.2	26.1	21.5	24.0	23.3	19.2	21.0	23.0					
Jun. 20	21.3	25.8	24.1	26.2	26.2	21.4	23.8	24.8					
Jul. 11	23.9	25.8	29.0	28.0	29.0	24.5	26.5	26.1					
Jul. 26	24	26.0	28	28.0	28.0	25.0	26.5	25.5					
Aug. 8	23.0	26.0	27	26.5	27.0	23.0	24.5	24.5					
Aug. 22	23.1	24.2	27.2	26.0	27.4	23.8	25.5	25.0					
FALL													
Sep. 5	16.5	18.0	20.5	19.0	20.0	17.5	17.5	18.0					
Sep. 17	18.5	21.5	20	21.0	21.5	18.0	19.0	20.5					
Oct. 3	16.0	21.5	19	22.5	22.0	15.0	16.0	15.5					
Oct. 17	17.0	17.5	16.5	16.0	16.0	13.5	15.0	15.5					
Nov. 7	11.0	14.5	12.5	15.0	14.0	11.5	13.0	12.5					
Nov. 21	10.5	9.8	14.0	12.5	13.0	10.5	11.5	11.0					
WINTER													
Dec. 12	6.5	17.5	10.4	7.0	7.0	6.0	5.5	7.0					
Dec. 26	6.3	6.0	6.0	7.0	7.0	6.0	7.0	6.0					
Jan. 9	8.5	20.5	11.0	11.0	9.0	8.0	8.0	9.5					
Jan. 23	4.5	10.5	6.0	6.5	6.0	4.5	5.0	6.5					
Feb. 6	7.5	16.5	6.0	8.0	9.0	8.0	8.0	7.0					
Feb. 20	6.5	10.5	9.5	10.0	10.0	6.0	8.0	9.0					
MEAN	14.9	19.5	17.2	17.7	17.9	14.6	15.9	16.7					
RANGE	4.5-24.0	6.0-26.0	6.0-29.0	6.5-28.0	6.0-29.0	4.5-25.0	5.0-26.5	6.0-26.1					

Table C-4
BASEFLOW WATER QUALITY DATA

Dissolved Oxygen (mg/l)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	7.9	7.6	7.25	3.2	4.5	8.1	5.2	2.5					
Mar. 26	10.0	9.1	8.8	7.25	8.4	10.4	9.3	7.05					
Apr. 11	7.8	8.6	6.0	9.35	5.8	7.4	7.2	2.0					
Apr. 25	8.2	6.5	4.3	1.75	4.55	8.0	4.9	2.4					
May 9	6.2	6.8	1.0	1.5	3.0	5.9	1.0	5.8					
May 23	7.0	6.8	4.8	0.2	2.3	6.8	2.4	5.7					
SUMMER													
Jun. 6	7.5	5.9	3.8	1.3	3.1	7.6	3.2	7.2					
Jun. 20	5.75	6.4	2.95	2.0	1.5	5.7	1.2	1.8					
Jul. 11	0.7	8.6	3.5	2.0	3.3	3.9	0.9	2.8					
Jul. 26	0.4	5.7	5.4	2.2	3.2	0.3	0.2	3.4					
Aug. 8	1.0	9.2	5.5	5.0	3.2	1.5	0.1	4.1					
Aug. 22	1.5	7.3	4.8	2.8	2.8	1.6	.35	3.8					
FALL													
Sep. 5	6.6	8.1	4.6	1.1	4.0	3.7	2.5	6.0					
Sep. 17	6.2	8.3	5.1	1.8	4.3	2.1	1.8	4.7					
Oct. 3	4.5	8.7	5.9	4.6	5.4	0.9	0.6	5.6					
Oct. 17	0.4	10.1	7.0	5.0	6.2	1.7	0.1	5.2					
Nov. 7	7.2	10.0	5.4	4.7	3.3	4.4	0.8	6.1					
Nov. 21	7.8	9.8	7.1	4.1	4.7	8.2	3.7	8.0					
WINTER													
Dec. 12	10.6	9.1	10.3	6.7	9.1	11.1	7.6	10.2					
Dec. 26	10.6	10.7	9.5	6.2	7.9	10.4	7.4	10.2					
Jan. 9	9.9	8.8	9.2	3.6	8.1	10.1	7.1	8.0					
Jan. 23	10.9	9.6	11.1	4.7	9.9	11.5	9.3	9.1					
Feb. 6	12.5	11.2	11.6	9.4	10.5	12.4	10.4	12.0					
Feb. 20	10.1	9.8	9.8	5.0	8.4	11.5	7.7	9.1					
MEAN	6.7	8.4	6.4	3.9	5.3	6.5	3.9	5.9					
RANGE	0.4-12.5	5.7-11.2	1.0-11.6	0.2-9.4	1.5-10.5	0.3-12.4	0.1-10.4	1.8-12.0					

Table C-5
BASEFLOW WATER QUALITY DATA
Free Carbon Dioxide (mg/1)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	10.1	7.6	6.06	13.1	10.1	6.06	13.13	13.1					
Mar. 26	4.04	4.04	6.06	7.07	7.6	5.6	5.05	6.06	2.43	3.04	2.02	1.21	0.0
Apr. 11	6	4	8.5	7.5	8	8	4	10					
Apr. 25	8	8.5	10	12.5	9.5	5.0	10.5	12	0.5	2	2	2.5	1.0
May 9	9.5	5	14	21	11	9.0	12	10					
May 23	9	7	10	17	12	5	13	10	0	2.5	3	5	5
SUMMER													
Jun. 6	7	7	10	15.5	12	6	13	10.5					
Jun. 20	12	6	16	13	16	18	15	13	0	0	2	4	3.5
Jul. 11	15.5	4	10	16	15	13	15	8					
Jul. 26	17	10	12	14	11	19	22	10	7.0	4	0	3.0	3.0
Aug. 8	12	6.0	9.0	14	11.0	16	21	12					
Aug. 22	12	9	9	15	11	12	17	8	9	7	2	4.0	5
FALL													
Sep. 5	7	4	14	14	9.0	8	11	11					
Sep. 17	9	4	14	16	10	11	12	13	0	0	0	0	4.0
Oct. 3	6	5	9	20	7	13	16	16					
Oct. 17	17	6	7.0	12	6	9.0	18	13	4	3	3	3	2
Nov. 7	5	3	9.0	7.0	7	6.0	11	7.0					
Nov. 21	5	4	5	9	8	5	9	8	8	2	3	3	4
WINTER													
Dec. 12	4	6	4	7	4	2	9	6					
Dec. 26	3	3	3	4	4	4	6	5	NS	7	5	8	5
Jan. 9	4	5	6	23	5	3	7	8					
Jan. 23	2	3	5	12	3	3	4	5	3	2	3	3	3
Feb. 6	4	5	5	8	4	6	5	5					
Feb. 20	3	3	6	23	4	3	4	8	3	2	0	2	1
MEAN	7.9	5.4	8.7	13.4	8.6	8.2	11.4	9.5	3.4	2.9	2.1	3.2	3.0
RANGE	2-17	3-10	3-16	4-23	3-16	2-19	4-22	5-13.1	0-9	0-7	0-5	0-8	0-5

Table C-6
BASEFLOW WATER QUALITY DATA
True Color (Platinum-Cobalt Units)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	25	10	10	30	5	40	80	15					
Mar. 26	5	25	10	10	10	5	10	40	5	5	10	5	5
Apr. 11	15	35	60	30	35	25	65	30					
Apr. 25	70	40	35	70	80	50	30	38	10	15	20	35	15
May 9	80	75	80	45	105	55	90	20					
May 23	120	25	140	90	140	105	130	60	25	22	30	45	35
SUMMER													
Jun. 6	110	135	110	170	170	110	140	100					
Jun. 20	145	80	180	75	150	125	145	85	25	40	55	80	60
Jul. 11	105	90	190	165	195	110	135	22					
Jul. 26	120	70	55	80	90	130	80	50	25	40	20	20	15
Aug. 8	100	20	70	45	70	140	20	60					
Aug. 22	100	70	80	70	60	140	120	45	90	80	30	30	15
FALL													
Sep. 5	100	100	120	100	100	100	110	90					
Sep. 17	140	40	160	120	120	-	-	-	50	40	20	20	30
Oct. 3	120	140	160	60	140	200	110	70					
Oct. 17	160	20	80	80	70	200	80	60	50	50	20	20	20
Nov. 7	100	45	140	40	110	120	120	100					
Nov. 21	60	55	110	70	90	100	120	100	55	25	20	30	75
WINTER													
Dec. 12	120	180	140	110	90	100	110	140					
Dec. 26	110	165	55	140	90	110	80	140	90	25	25	30	50
Jan. 9	50	40	50	60	90	50	80	70					
Jan. 23	60	70	90	130	80	60	100	110	55	30	60	60	50
Feb. 6	60	180	80	110	90	110	110	120					
Feb. 20	70	45	110	160	90	70	120	120	55	30	50	60	80
MEAN	89	73	96	86	95	98	95	73	45	36	30	36	38
RANGE	5-160	10-180	10-190	10-170	5-195	5-200	20-145	115-140	5-90	5-80	10-60	5-80	5-80

Table C-7
BASEFLOW WATER QUALITY DATA

Turbidity (Jackson Turbidity Units)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	55	22	50	19	35	55	75	35					
Mar. 26	12	10	25	10	35	15	42	22	35	10	20	7	10
Apr. 11	30	9	15	15	30	10	50	45					
Apr. 25	10	60	7	12	25	30	30	11	20	10	17	8	15
May 9	10	20	20	30	5	5	10	22					
May 23	20	5	35	25	22	25	30	25	10	15	10	10	30
SUMMER													
Jun. 6	17	25	30	50	50	35	40	15					
Jun. 20	39	25	60	28	41	38	47	30	19	22	24	34	64
Jul. 11	55	41	23	10	15	25	12	35					
Jul. 26	<80	45	30	10	30	<80	15	<80	<80	<80	<80	<80	<80
Aug. 8	<80	<80	<80	<80	<80	<80	<80	<80					
Aug. 22	<80	177	<80	<80	<80	<80	<80	<80	88	105	<80	<80	<80
FALL													
Sep. 5	<80	<80	<80	<80	<80	<80	<80	<80					
Sep. 17	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80
Oct. 3	<80	<80	<80	<80	<80	<80	<80	<80					
Oct. 17	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80
Nov. 7	<80	<80	<80	<80	<80	<80	<80	<80					
Nov. 21	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	34
WINTER													
Dec. 12	<80	170	<80	<80	<80	<80	<80	<80					
Dec. 26	<80	290	<80	78	<80	<80	<80	<80	<80	<80	<80	<80	<80
Jan. 9	<80	<80	<80	<80	<80	<80	<80	<80					
Jan. 23	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80
Feb. 6	<80	100	<80	<80	<80	<80	<80	<80					
Feb. 20	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80
MEAN	60	75	59	55	59	60	61	60	61	60	59	58	64
RANGE	10-80	5-290	7-80	10-80	5-80	5-80	10-80	11-80	10-80	10-105	10-80	7-80	10-94

Table C-8

BASEFLOW WATER QUALITY DATA

Secchi Transparency (cm)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12													
Mar. 26									47.6	66.3	40.6	22.9	63.5
Apr. 11													
Apr. 25									53.3	61.0	67.3	48.3	63.5
May 9													
May 23									64.8	64.8	77.5	77.5	53.3
SUMMER													
Jun. 6													
Jun. 20									69.3	74.4	76.2	72.4	27.9
Jul. 11													
Jul. 26									36.8	27.4	79.5	68.7	79.4
Aug. 8													
Aug. 22									28.0	25.4	63.5	73.8	68.7
FALL													
Sep. 5													
Sep. 17									40.6	48.3	66.0	68.7	63.5
Oct. 3													
Oct. 17									73.2	70.1	68.6	62.5	68
Nov. 7													
Nov. 21									62.5	79.2	79.2	56.4	16.5
WINTER													
Dec. 12													
Dec. 26									30.5	94.6	74.8	73.5	54.8
Jan. 9													
Jan. 23									84.46	86.36	53.3	45.7	55.3
Feb. 6													
Feb. 20									57.9	86.8	47.2	39.6	39.6
MEAN									54.1	65.4	66.1	59.2	54.5
RANGE									28-84.46	25.4-94.6	40.6-79.5	22.9-77.5	27.9 79.4

Table C-9
BASEFLOW WATER QUALITY DATA
Total Coliform Bacteria (per 100 ml)

SAMPLING DATE	STATION NUMBER 1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	53,600	32,000	150,000	156,000	30,100	84,800	121,000	130,000					
Mar. 26	1,380	35,300	11,900	347,000	18,000	8,300	16,100	47,000	13,300	157,000	3,480	12,100	10,800
Apr. 11	4,700	9,500	5,200	14,200	4,500	3,000	10,700	630,000					
Apr. 25	8,900	77,000	7,600	9,100	16,000	19,300	27,000	125,000	11,000	6,200	5,600	9,300	6,600
May 9	6,800	21,000	9,700	146,000	4,600	10,400	10,900	25,000					
May 23	36,000	200	7,700	5,300	1,800	2,200	4,700	3,900	900	500	750	120	600
SUMMER													
Jun. 6	8,800	10,700	11,300	9,500	4,700	21,200	12,400	15,100					
Jun. 20	76,000	90,000	62,000	58,400	25,200	62,000	12,800	174,000	7,100	860	130	700	2,600
Jul. 11	143,000	63,000	81,000	148,000	10,500	23,000	16,800	20,200					
Jul. 26	11,200	81,000	5,400	-	2,900	16,400	23,500	13,100	78,000	12,400	320	198	227
Aug. 8	7,100	13,800	900	27,000	2,800	1,100	234,000	75,000					
Aug. 22	3,300	3,700	2,300	620,000	3,200	4,900	330,000	5,600	44,000	1,900	120	100	110
FALL													
Sep. 5	21,100	73,000	44,000	121,000	33,000	22,300	14,000	126,000					
Sep. 17	15,500	1,000	44,000	75,000	13,800	19,900	12,000	9,500	13,200	7,000	1,500	1,100	2,000
Oct. 3	6,600	12,200	21,400	26,000	1,100	47,000	13,600	39,000					
Oct. 17	8,200	2,300	13,400	140,000	10,400	10,600	11,000	83,000	10,100	73,000	22,300	158,000	13,300
Nov. 7	610	42	820	6,400	170	1,600	220	6,600					
Nov. 21	1,200	100	14,100	252,000	62,000	132,000	10,300	28,400	125,000	15,800	2,700	2,500	10,900
WINTER													
Dec. 12	26,200	0	86,000	69,000	63,000	42,000	19,200	71,000					
Dec. 26	106,000	291,000	254,000	239,000	13,900	193,000	15,300	413,000	760,000	5,700	3,600	1,300	6,100
Jan. 9	4,700	0	11,900	111,000	8,100	3,100	71,000	93,000					
Jan. 23	1,100	0	2,800	72,000	7,300	3,300	34,000	53,000	321,000	307,000	21,300	1,310	7,300
Feb. 6	1,600	500	10,800	64,000	12,700	4,500	6,700	23,100					
Feb. 20	1,400	2,100	3,400	9,100	3,200	3,900	4,800	19,500	18,500	5,500	4,800	21,700	1,800
MEAN	23,125	34,143	35,901	118,478	12,382	30,825	43,001	92,875	116,842	49,405	5,550	17,369	5,195
RANGE	610-143,000	0-291,000	820-254,000	6,400-620,000	170-63,000	1,100-193,000	220-330,000	3,900-630,000	900-760,000	500-307,000	120-22,300	100-158,000	110-13,300

Table C-10
BASEFLOW WATER QUALITY DATA

Fecal Coliform Bacteria (per 100 ml)

SAMPLING DATE	STATION NUMBER 1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	3,700	220	1,160	3,100	1,600	6,600	9,300	26,800					
Mar. 26	60	300	390	39,000	1,100	200	2,100	1,200	230	1,470	270	130	110
Apr. 11	10	600	200	500	300	110	530	216,000					
Apr. 25	300	750	210	630	260	280	220	1,010	300	110	80	120	200
May 9	70	51	131	690	32	260	300	610					
May 23	1,800	50	2,300	3,900	400	40	2,500	2,100	300	100	250	20	210
SUMMER													
Jun. 6	4,300	6,910	6,300	6,200	1,830	13,000	5,500	10,300					
Jun. 20	460	2,200	180	3,500	210	1,100	320	1,410	230	0	10	140	240
Jul. 11	5,300	2,200	2,100	1,120	143	710	320	1,800					
Jul. 26	2,300	2,700	410	-	620	320	750	5,600	3,700	570	130	38	47
Aug. 8	300	210	0	2,600	100	0	9,100	6,700					
Aug. 22	210	730	320	3,400	220	400	2,600	110	2,700	130	0	0	0
FALL													
Sep. 5	700	1,900	1,300	6,500	1,100	610	1,200	14,100					
Sep. 17	280	0	350	1,300	170	200	100	2,100	1,130	340	0	160	100
Oct. 3	10	70	80	140	40	50	0	2,100					
Oct. 17	11	0	120	4,360	2,200	210	130	860	81	890	10	110	170
Nov. 7	110	0	230	3,500	0	10	0	1,710					
Nov. 21	30	0	1,200	14,100	210	670	180	1,500	19,900	430	20	10	620
WINTER													
Dec. 12	790	0	3,100	1,210	950	940	260	4,100					
Dec. 26	1,030	5,600	6,100	2,700	350	3,100	550	6,900	9,200	30	40	0	230
Jan. 9	80	0	370	480	120	50	140	4,800					
Jan. 23	7	0	140	850	40	320	50	1,310	350	20	0	10	140
Feb. 6	70	0	920	1,820	1,050	210	520	840					
Feb. 20	20	10	250	340	120	110	70	2,510	280	10	0	0	50
MEAN	915	1,021	1,161	4,432	549	1,229	1,531	13,186	3,200	342	68	62	176
RANGE	7-5,300	0-6,910	0-6,300	140-39,000	0-2,200	0-13,000	0-9,300	110-216,000	81-19,900	0-1,470	0-270	0-160	0-620

Table C-11

BASEFLOW WATER QUALITY DATA

Fecal Streptococcus Bacteria (per 100 ml)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	1.270	60	6,700	2,020	550	3,350	8,800	9,800					
Mar. 26	120	0	20	300	31	20	120	40	1,150	2,650	10	0	0
Apr. 11	40	300	60	200	210	50	100	48,000					
Apr. 25	400	560	180	580	160	740	200	300	80	60	80	40	41
May 9	240	20	21	1,500	72	280	93	560					
May 23	730	0	880	760	230	0	720	130	20	0	0	0	10
SUMMER													
Jun. 6	2,700	1,120	1,410	690	730	5,800	1,310	1,730					
Jun. 20	380	170	181	160	51	670	210	170	0	0	0	0	0
Jul. 11	1,250	370	80	230	330	780	140	250					
Jul. 26	1,900	830	140	-	380	310	180	670	1,390	30	0	0	0
Aug. 8	110	320	0	1,560	0	0	1,010	590					
Aug. 22	10	30	0	140	0	10	80	50	300	0	0	0	0
FALL													
Sep. 5	10	110	600	700	120	20	40	1,900					
Sep. 17	320	0	320	1,110	220	170	50	1,590	80	120	10	0	10
Oct. 3	50	10	30	150	60	30	110	210					
Oct. 17	10	0	380	930	230	50	180	580	180	30	0	0	0
Nov. 7	0	0	0	3,300	0	0	0	1,100					
Nov. 21	90	0	1,800	1,400	150	790	110	550	410	10	40	110	130
WINTER													
Dec. 12	1,030	0	4,700	2,200	510	1,460	270	6,400					
Dec. 26	2,280	8,100	10,900	4,200	310	2,700	1,290	7,800	16,600	20	90	20	60
Jan. 9	30	0	110	80	210	50	10	940					
Jan. 23	0	0	70	870	50	60	50	640	140	0	0	0	20
Feb. 6	30	0	570	490	590	160	610	1,050					
Feb. 20	0	0	190	10	50	40	30	440	190	0	10	0	0
MEAN	542	500	1,174	1,025	219	731	655	3,425	1,712	243	22	14	21
RANGE	0-2,280	0-8,100	0-10,900	10-4,200	0-3,350	0-5,800	0-8,800	40-48,000	0-16,600	0-2,650	0-90	0-110	0-130

Table C-12
BASEFLOW WATER QUALITY DATA
Biological Oxygen Demand (mg/l)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	4.1	2.4	4.1	5.9	2.9	4.6	5.8	8.6					
Mar. 26	4.8	4.7	4.1	7.8	4.1	4.1	7.7	4.6	4.8	7.2	5.5	6.7	5.9
Apr. 11	9.7	11.0	9.4	12.1	9.5	9.0	12.7	>28					
Apr. 25	4.7	4.8	4.6	5.0	4.8	3.8	5.0	8.5	5.4	4.5	5.4	5.7	3.5
May 9	18	2.7	1.2	5.0	3.6	2.1	3.4	2.6					
May 23	3.1	2.5	3.8	6.8	4.3	4.5	5.4	3.3	4.6	3.3	4.1	3.8	2.8
SUMMER													
Jun. 6	3.6	5.5	5.5	3.5	3.0	6.1	5.4	5.2					
Jun. 20	5.8	7.1	10	13	4	16	60	62	6.0	5.4	6.4	2.9	2.2
Jul. 11	24	65	30	32	46	73	29	29					
Jul. 26	8	3	26	25	14	5.0	13	19	6.7	11	6.3	>7.6	4.9
Aug. 8	4.7	3.3	6.2	5.9	5.2	3.8	51	5.8					
Aug. 22	3.4	1.1	7.0	7.1	3.5	5.9	15	5.4	6.2	8.1	7.2	4.1	2.7
FALL													
Sep. 5	3.4	5.4	2.8	4.1	4.5	4.4	4.2	2.2					
Sep. 17	4.3	0.1	2.5	3.7	1.2	3.0	3.6	21	3.6	5.5	1.6	3.7	0.6
Oct. 3	5.8	4.4	4.9	4.8	2.2	6.9	9	7.5					
Oct. 17	2.5	2.2	2.0	15	0.7	2.7	4.2	2.2	2.8	4.2	2.3	1.0	0.8
Nov. 7	1.9	1.2	3.4	4.1	2.6	5.5	7.3	5.6					
Nov. 21	3.1	3.3	3.7	4.7	3.6	2.4	4.7	5.5	6.9	4.7	5.8	5.9	3.2
WINTER													
Dec. 12	3.6	4.0	2.4	5.8	3.1	3.8	3.7	4.2					
Dec. 26	4.2	5.3	4.4	4.7	2.9	3.5	4.9	5.4	4.8	3.6	5.0	3.4	2.9
Jan. 9	3.3	0.7	3.7	4.6	4.6	5.3	5.6	4.9					
Jan. 23	1.9	1.6	2.4	3.7	1.9	1.0	2.6	3.6	3.3	4.8	4.7	4.0	3.4
Feb. 6	5.8	3.6	4.6	3.4	5.2	7.2	6.3	6.7					
Feb. 20	3.6	1.3	2.7	3.1	1.9	1.4	1.1	1.2	3.6	3.8	4.2	3.6	5.1
MEAN	5.7	6.1	6.3	7.9	5.8	7.7	11.3	10.5	4.9	5.5	4.9	4.4	3.2
RANGE	1.9-24	0.1-65	1.2-30	3.7-32	0.7-46	1.0-73	2.6-60	2.2-62	2.8-6.9	3.3-11	1.6-7.2	1.0-7.6	0.6-5.9

Table C-13
BASEFLOW WATER QUALITY DATA
Chemical Oxygen Demand (mg/l)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	22	8	25	16	19	27	24	11					
Mar. 26	10	8	11	23	16	15	19	7	8	12	8	9	9
Apr. 11	6.4	6.4	6.4	11.2	>45	16	13	9.6					
Apr. 25	24	36	36	38	28	26	39	23	41	39	34	27	17
May 9	21	8	9	5	32	20	20	4					
May 23	36	5	22	42	14	5	5	5	25	26	18	14	24
SUMMER													
Jun. 6	23	30	25	32	27	32	39	30					
Jun. 20	22	18	-	24	31	18	35	26	24	24	33	20	14
Jul. 11	34	45	24	48	43	48	48	40					
Jul. 26	32	10	7	30	17	31	42	19	23	63	20	14	7
Aug. 8	31	6	31	41	27	17	26	62					
Aug. 22	35	25	46	25	43	22	33	31	34	27	18	43	29
FALL													
Sep. 5	25	34	25	31	21	44	17	23					
Sep. 17	18	31	29	14	27	18	14	27	28	36	25	38	34
Oct. 3	36	17	25	30	23	17	21	22					
Oct. 17	27	7	27	24	11	33	29	14	10	13	33	28	22
Nov. 7	29	25	16	19	13	10	19	16					
Nov. 21	22	36	14	18	25	25	14	33	25	22	30	21	25
WINTER													
Dec. 12	27	18	36	22	23	33	27	14					
Dec. 26	22	14	17	26	26	25	28	41	14	23	31	18	22
Jan. 9	17	21	17	22	25	21	25	12					
Jan. 23	*	32	39	-	21	17	25	21	22	25	23	31	31
Feb. 6	27	14	22	18	27	27	25	18					
Feb. 20	11	22	19	36	22	9	14	22	23	14	23	33	31
MEAN	24	20	23	26	25	23	25	22	23	27	25	25	22
RANGE	6.4-36	5-45	7-46	5-48	11-45	5-48	5-48	4-62	8-41	13-63	8-34	9-43	7-34

Table C-14
BASEFLOW WATER QUALITY DATA
Ammonia Nitrogen (mg/l)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	0.19	0.20	0.16	0.54	0.21	0.14	0.30	0.24					
Mar. 26	0.29	0.33	0.28	0.33	0.27	0.19	0.20	0.26	0.36	0.26	0.30	0.26	0.31
Apr. 11	0.15	0.16	0.15	0.20	0.16	0.36	0.53	2.87					
Apr. 25	0.19	0.15	0.13	0.25	0.12	0.08	0.19	0.13	0.12	0.12	0.08	0.11	0.08
May 9	0.23	0.21	0.42	0.90	0.39	0.33	0.61	0.21					
May 23	0.07	0.18	0.14	1.20	0.39	0.07	0.08	0.08	0.07	0.34	0.23	0.08	0.07
SUMMER													
Jun. 6	0.08	0.05	0.04	0.33	0.12	0.07	0.26	0.16					
Jun. 20	0.16	0.09	0.33	0.20	0.37	0.17	0.33	0.36	0.08	0.09	0.15	0.08	0.08
Jul. 11	0.21	0.10	0.16	0.40	0.86	0.23	0.36	0.21					
Jul. 26	0.13	0.08	0.23	0.78	0.11	0.15	0.31	0.39	0.25	0.39	0.07	0.15	0.08
Aug. 8	0.07	0.09	0.07	0.06	0.19	0.64	2.4	0.39					
Aug. 22	0.05	0.16	0.36	0.50	0.06	0.25	4.67	0.31	0.07	0.17	0.56	0.05	0.06
FALL													
Sep. 5	0.16	0.19	0.18	0.14	0.14	0.14	0.08	0.19					
Sep. 17	0.08	0.17	0.08	0.61	0.08	0.18	1.09	0.10	0.09	0.14	0.08	0.05	0.06
Oct. 3	0.14	0.12	0.08	1.48	0.07	0.28	1.17	0.28					
Oct. 17	0.23	0.46	0.24	0.28	0.24	0.39	0.86	0.62	0.30	0.37	0.59	0.11	0.37
Nov. 7	0.50	0.23	0.40	0.87	1.04	0.25	1.09	0.91					
Nov. 21	0.37	0.33	0.39	0.25	0.23	0.28	0.26	0.21	0.21	0.35	0.28	0.51	0.29
WINTER													
Dec. 12	-	-	-	-	-	-	-	-					
Dec. 26	-	-	-	-	-	-	-	-	-	-	-	-	-
Jan. 9	0.1	0.1	0.1	1.75	1.8	0.1	0.2	0.3					
Jan. 23	0.1	0.1	0.1	1.4	0.2	0.1	0.3	0.4	0.1	0.1	0.1	0.1	0.1
Feb. 6	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1					
Feb. 20	0.1	0.2	0.1	0.9	0.1	0.1	0.2	0.4	0.1	0.1	0.1	0.1	0.1
MEAN	0.17	0.17	0.19	0.59	0.33	0.21	0.71	0.41	0.16	0.22	0.23	0.15	0.15
RANGE	0.05-0.50	0.05-0.46	0.04-0.42	0.06-1.48	0.06-1.8	0.07-0.64	0.08-4.67	0.08-2.87	0.07-0.36	0.09-0.39	0.07-0.59	0.05-0.51	0.06-0.37

Table C-15
BASEFLOW WATER QUALITY DATA
Nitrate Nitrogen (mg/l)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	0.31	0.28	0.46	0.74	0.42	0.39	0.55	0.48					
Mar. 26	0.15	0.15	0.26	0.46	0.42	0.18	0.68	0.22	0.20	0.22	0.48	0.22	0.15
Apr. 11	0.20	0.30	0.30	0.70	1.30	0.20	1.00	0.60					
Apr. 25	0.20	0.40	0.40	0.60	0.40	0.40	0.80	0.40	0.30	0.20	0.30	0.30	0.40
May 9	0.25	0.20	0.20	0.14	0.38	0.29	0.54	0.14					
May 23	0.40	0.30	0.50	0.60	0.50	0.60	0.70	0.30	0.50	1.00	0.30	0.50	0.80
SUMMER													
Jun. 6	0.63	1.06	0.27	0.63	0.54	1.24	0.57	0.41					
Jun. 20	0.41	0.29	0.45	0.32	0.47	0.45	0.81	0.38	0.23	0.41	0.23	0.41	0.57
Jul. 11	0.18	0.16	0.11	0.41	0.27	1.10	0.27	0.20					
Jul. 26	0.45	0.27	0.25	0.56	0.38	5.5	0.59	0.34	0.23	0.32	0.25	1.3	0.43
Aug. 8	0.36	0.14	0.43	0.61	0.59	0.36	0.61	0.61					
Aug. 22	0.47	0.18	0.27	0.66	0.34	0.54	0.68	0.34	0.25	0.63	0.25	0.18	0.23
FALL													
Sep. 5	0.54	0.52	0.95	0.45	0.54	0.77	0.95	0.93					
Sep. 17	1.18	0.41	0.45	0.63	0.59	0.66	0.93	0.97	0.38	0.36	0.25	0.36	0.43
Oct. 3	0.41	0.47	0.50	1.15	1.22	0.97	1.10	0.36					
Oct. 17	0.45	0.15	0.26	0.50	0.43	0.68	1.60	0.40	0.38	2.56	0.05	0.46	0.13
Nov. 7	2.51	2.24	3.11	3.04	2.98	1.88	2.57	5.28					
Nov. 21	0.15	1.15	0.41	1.38	0.63	-	2.31	0.34	0.25	0.22	0.16	-	0.69
WINTER													
Dec. 12	-	-	-	-	-	-	-	-					
Dec. 26	0.3	0.5	0.8	-	0.4	0.5	1.0	1.4	0.6	0.9	-	-	2.6
Jan. 9	0.3	0.4	0.4	0.64	0.6	1.6	1.5	0.5					
Jan. 23	0.3	0.3	0.3	0.5	0.5	0.4	0.8	0.6	0.5	0.4	0.4	0.4	0.6
Feb. 6	0.3	0.2	0.3	1.7	0.6	0.4	0.4	0.6					
Feb. 20	-	0.6	0.6	0.4	0.3	0.2	0.7	-	0.3	0.2	0.2	0.2	0.4
MEAN	0.48	0.46	0.52	0.76	0.64	1.02	0.94	0.72	0.34	0.62	0.67	1.23	0.62
RANGE	0.15-1.18	0.14-9.4	0.11-17	0.14-3.04	0.27-6.0	0.20-1.88	0.27-2.57	0.14-5.28	0.20-0.6	0.20-2.56	0.05-5.2	0.18-1.3	0.13-2.6

Table C-16
BASEFLOW WATER QUALITY DATA
Nitrite Nitrogen (mg/1)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	0.00	0.01	0.00	0.03	0.00	0.00	0.01	0.01					
Mar. 26	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.01	0.00	0.00	0.01	0.00	0.00
Apr. 11	0.01	0.02	0.01	0.04	0.01	0.00	0.00	0.02					
Apr. 25	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
May 9	0.00	0.04	0.00	0.02	0.01	0.00	0.02	0.00					
May 23	0.00	0.02	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
SUMMER													
Jun. 6	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00					
Jun. 20	0.00	0.02	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Jul. 11	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.01					
Jul. 26	0.00	0.02	0.00	0.01	0	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
Aug. 8	0.00	0.02	0.00	0.06	0.01	0.00	0.01	0.04					
Aug. 22	0.00	0.04	0.00	0.01	0.00	0.00	0.00	0.03	0.02	0.00	0.00	0.00	0.01
FALL													
Sep. 5	0.00	0.01	0.00	0.01	0.00	0.00	0.03	0.00					
Sep. 17	0.00	0.04	0.00	0.14	0.02	0.00	0.20	0.02	0.00	0.04	0.00	0.00	0.03
Oct. 3	0.00	0.05	0.00	0.11	0.00	0.00	0.02	0.02					
Oct. 17	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01
Nov. 7	0.00	0.02	0.00	0.04	0.00	0.00	0.00	0.01					
Nov. 21	0.00	0.02	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
WINTER													
Dec. 12	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.01					
Dec. 26	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.01	0.02	0.00	0.00	0.00	0.00
Jan. 9	0.00	0.03	0.00	0.01	0.01	0.00	0.01	0.01					
Jan. 23	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Feb. 6	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00					
Feb. 20	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	0.00	0.02	0.00	0.02	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.01
RANGE	0.00-0.01	0.00-0.05	0.00-0.01	0.00-0.14	0.00-0.02	0.00-0.00	0.01-0.02	0.00-0.04	0.00-0.02	0.00-0.04	0.00-0.01	0.00-0.01	0.00-0.03

Table C-17
BASEFLOW WATER QUALITY DATA
Total Kjeldahl Nitrogen (mg/l)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	1.33	0.93	1.46	2.46	1.32	1.49	2.17	2.87					
Mar. 26	1.44	1.07	1.47	2.08	1.98	1.43	2.23	1.78	2.34	2.03	1.86	1.89	2.00
Apr. 11	0.46	0.78	1.16	1.86	1.10	0.88	2.32	4.34					
Apr. 25	0.91	1.55	1.86	2.02	1.41	1.83	1.07	2.19	0.38	1.41	1.83	0.99	1.18
May 9	1.05	0.40	1.01	2.32	1.29	1.00	1.88	0.40					
May 23	0.99	0.43	1.60	2.20	0.93	1.20	2.20	0.64	0.53	1.50	0.60	1.20	0.46
SUMMER													
Jun. 6	0.74	1.50	1.60	1.80	1.30	1.20	1.50	0.74					
Jun. 20	1.20	1.40	2.00	2.00	2.60	0.25	2.80	1.70	1.10	1.10	1.80	1.10	0.74
Jul. 11	1.30	0.53	1.20	2.20	4.30	0.90	1.90	1.30					
Jul. 26	2.0	0.62	1.9	4.5	1.9	1.3	2.8	1.7	2.9	4.3	1.7	1.9	1.3
Aug. 8	0.85	1.86	1.86	2.9	6.4	0.84	6.4	3.6					
Aug. 22	1.3	0.8	1.7	3.1	1.2	1.7	6.8	1.5	1.9	2.3	1.2	0.9	1.4
FALL													
Sep. 5	1.55	2.32	2.02	2.24	1.55	1.70	4.03	2.17					
Sep. 17	1.24	0.93	1.53	2.02	1.55	2.17	2.94	1.70	2.64	2.17	1.70	1.70	1.46
Oct. 3	0.79	0.25	0.85	1.87	0.67	1.10	2.65	1.10					
Oct. 17	2.03	0.94	1.87	3.58	1.72	1.72	2.81	2.19	2.34	2.34	1.57	2.03	1.72
Nov. 7	2.70	1.69	2.50	2.65	2.34	2.65	2.87	3.16					
Nov. 21	1.89	1.91	2.37	1.97	1.32	1.64	2.31	1.83	2.26	2.19	1.38	2.09	1.64
WINTER													
Dec. 12	-	-	-	-	-	-	-	-					
Dec. 26	-	-	-	-	-	-	-	-	-	-	-	-	-
Jan. 9	0.5	0.5	0.7	3.12	3.1	0.6	1.3	1.8					
Jan. 23	0.0	0.1	0.1	2.1	0.2	0.3	0.7	1.0	0.6	0.8	0.5	0.7	0.3
Feb. 6	0.9	0.6	1.1	1.8	1.1	1.1	1.6	1.6					
Feb. 20	1.1	1.6	2.0	2.8	2.0	3.1	1.9	1.2	2.4	2.5	2.4	2.5	2.2
MEAN	1.19	1.03	1.54	2.44	1.88	1.37	2.60	1.84	1.76	2.06	1.50	1.55	1.31
RANGE	0.46-2.70	0.1-2.32	0.1-2.50	1.80-4.5	0.2-6.4	0.25-2.65	0.7-6.8	0.40-4.34	0.38-2.64	0.8-4.3	0.5-1.86	0.7-2.09	0.3-2.00

Table C-18
BASEFLOW WATER QUALITY DATA
Total Phosphorus (mg/l)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	0.05	0.56	0.15	0.59	0.18	0.07	0.36	0.33					
Mar. 26	0.03	0.04	0.05	0.36	0.13	0.02	0.52	0.25	0.10	0.08	0.09	0.10	0.13
Apr. 11	0.00	0.19	0.05	0.10	0.14	0.02	0.60	0.44					
Apr. 25	0.02	0.13	0.07	0.28	0.10	0.01	0.15	0.13	0.05	0.08	0.07	0.06	0.04
May 9	0.04	0.38	0.07	0.18	0.15	0.02	0.41	0.24					
May 23	0.01	0.04	0.01	0.13	0.02	0.07	0.05	0.02	0.03	0.05	0.01	0.01	0.00
SUMMER													
Jun. 6	0.23	0.07	0.26	0.11	0.35	0.08	0.39	0.20					
Jun. 20	0.09	0.17	0.10	0.08	0.04	0.01	0.63	0.18	0.11	0.10	0.05	0.04	0.02
Jul. 11	0.18	0.04	0.11	0.06	0.19	0.10	0.36	0.36					
Jul. 26	0.06	0.14	0.09	0.08	0.14	0.01	0.09	0.14	0.00	0.08	0.08	0.08	0.05
Aug. 8	0.07	0.20	0.13	0.42	0.05	0.12	1.69	0.06					
Aug. 22	0.11	0.21	0.20	0.14	0.23	0.13	1.6	0.20	0.16	0.09	0.11	0.10	0.06
FALL													
Sep. 5	0.06	0.15	0.09	0.13	0.25	0.07	0.80	0.15					
Sep. 17	0.10	0.20	0.17	0.52	0.24	0.06	1.3	0.22	0.06	0.07	0.03	0.01	0.04
Oct. 3	.06	.31	.11	.07	.17	.06	.57	.11					
Oct. 17	0.31	0.22	0.16	0.93	0.40	0.08	0.30	0.58	0.22	0.18	0.24	0.17	0.14
Nov. 7	0.07	0.19	0.17	0.06	0.16	0.31	0.26	0.64					
Nov. 21	.03	.19	.11	.28	.20	.06	.96	.19	.20	.06	.04	.06	.09
WINTER													
Dec. 12	.07	.10	.12	.04	.12	.05	.09	.08					
Dec. 26	.04	.20	.08	.34	.10	.06	.60	.22	.18	.04	.08	.05	.04
Jan. 9	.04	.85	.10	0.13	.13	.04	.51	.16					
Jan. 23	.04	.23	.06	.19	.10	.06	.43	.20	.03	.07	.11	.07	.09
Feb. 6	0.04	0.72	0.08	0.15	0.11	0.04	0.10	0.16					
Feb. 20	0.06	0.21	0.08	0.20	0.09	0.03	0.35	0.30	0.09	0.08	0.11	0.11	0.08
MEAN	0.08	0.24	0.11	0.23	0.16	0.07	0.55	0.23	0.10	0.08	0.09	0.07	0.07
RANGE	0.00-0.31	.04-0.85	.01-0.26	0.04-0.93	.02-0.35	0.01-0.31	0.05-0.96	.02-0.64	0.00-0.22	.04-0.18	0.01-0.24	0.01-0.17	0.0-0.14

Table C-19
BASEFLOW WATER QUALITY DATA
Total Solids (mg/l)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	97	156	171	149	102	297	186	168					
Mar. 26	74	104	90	142	89	79	118	115	151	143	267	227	234
Apr. 11	100	141	107	206	104	90	162	188					
Apr. 25	83	74	78	80	140	63	87	125	108	103	197	166	205
May 9	85	111	94	119	97	93	240	114					
May 23	114	133	144	158	126	123	156	115	191	127	193	205	333
SUMMER													
Jun. 6	101	122	124	192	150	85	108	128					
Jun. 20	102	129	112	166	107	85	136	174	120	111	170	181	228
Jul. 11	96	120	103	230	234	105	143	159					
Jul. 26	159	143	164	181	124	128	171	190	222	243	222	176	218
Aug. 8	139	133	132	193	111	102	234	167					
Aug. 22	120	230	150	161	120	144	165	174	554	260	188	214	281
FALL													
Sep. 5	95	143	120	118	87	67	130	216					
Sep. 17	103	138	143	136	116	97	148	193	155	138	200	226	318
Oct. 3	112	164	144	199	93	109	177	178					
Oct. 17	120	116	116	180	75	126	152	179	139	170	226	255	282
Nov. 7	129	128	150	247	166	128	156	214					
Nov. 21	117	137	131	201	135	102	127	183	134	127	245	254	287
WINTER													
Dec. 12	181	299	213	153	116	118	157	283					
Dec. 26	106	297	116	161	110	86	125	171	158	119	254	260	246
Jan. 9	92	148	122	241	241	86	120	212					
Jan. 23	94	143	147	220	101	84	135	243	136	121	195	201	270
Feb. 6	97	193	103	154	120	106	119	200					
Feb. 20	143	123	165	194	119	95	138	212	141	126	202	201	265
MEAN	111	151	131	174	124	108	150	179	184	149	213	214	264
RANGE	74-181	74-299	78-213	80-247	75-241	63-297	87-240	114-283	108-554	103-260	170-267	166-260	205-333

Table C-20
BASEFLOW WATER QUALITY DATA
Suspended Solids (mg/l)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	0	29	66	8	21	212	89	21					
Mar. 26	0	16	15	16	12	10	29	12	42	40	0	0	29
Apr. 11	0	21	11	20	16	11	29	36					
Apr. 25	22	0	20	18	14	9	32	38	22	15	31	27	25
May 9	0	1	3	0	11	0	11	16					
May 23	16	28	51	26	26	23	46	7	13	13	18	18	29
SUMMER													
Jun. 6	0	3	29	56	63	0	30	6					
Jun. 20	25	18	25	27	3	0	19	6	31	22	8	25	38
Jul. 11	0	15	20	0	105	23	2	18					
Jul. 26	39	5	43	11	5	40	9	19	149	105	58	4	10
Aug. 8	60	19	50	35	35	17	90	25					
Aug. 22	22	76	31	43	0	16	20	25	425	38	14	26	4
FALL													
Sep. 5	0	12	32	10	18	0	14	20					
Sep. 17	3	14	48	21	7	6	21	0	46	0	7	13	36
Oct. 3	7	53	25	29	3	8	28	24					
Oct. 17	4	0	8	56	3	31	21	8	5	23	0	29	15
Nov. 7	31	0	38	19	41	14	24	18					
Nov. 21	26	39	25	37	36	1	29	31	0	16	0	17	50
WINTER													
Dec. 12	87	191	62	23	19	0	45	95					
Dec. 26	17	134	24	42	32	0	27	13	27	11	0	37	22
Jan. 9	0	19	29	0	0	13	18	0					
Jan. 23	19	18	54	48	15	4	55	29	4	30	6	32	31
Feb. 6	84	117	84	133	95	26	85	177					
Feb. 20	9	5	80	34	25	11	38	0	16	9	28	21	18
MEAN	20	35	36	30	25	20	34	27	65	27	14	21	26
RANGE	0-87	0-191	3-66	0-56	0-105	0-212	2-90	0-95	0-425	0-105	0-58	0-37	4-50

Table C-21
BASEFLOW WATER QUALITY DATA
Volatile Solids (mg/l)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	37	44	54	53	46	133	55	54					
Mar. 26	30	35	40	54	96	32	59	48	56	52	68	65	56
Apr. 11	45	58	41	77	45	40	71	92					
Apr. 25	16	31	44	15	32	11	12	25	23	13	35	37	60
May 9	28	20	45	39	38	37	40	39					
May 23	47	53	60	71	50	59	53	50	71	64	84	75	74
SUMMER													
Jun. 6	21	27	31	34	32	19	28	34					
Jun. 20	26	53	40	76	53	21	52	77	62	61	63	55	75
Jul. 11	47	45	38	100	102	48	70	69					
Jul. 26	55	51	21	69	78	29	54	28	71	100	118	69	62
Aug. 8	80	49	82	92	57	57	110	69					
Aug. 22	68	49	78	82	42	73	120	52	82	93	69	61	69
FALL													
Sep. 5	30	46	42	37	29	28	45	84					
Sep. 17	47	55	66	60	69	61	64	83	65	53	70	74	79
Oct. 3	40	53	43	76	43	42	73	57					
Oct. 17	51	44	44	97	44	54	58	79	82	86	68	84	67
Nov. 7	59	43	58	63	104	55	66	85					
Nov. 21	48	44	47	66	50	27	39	65	37	36	45	44	71
WINTER													
Dec. 12	109	77	104	68	41	37	65	158					
Dec. 26	33	45	31	41	25	24	22	39	42	13	67	76	47
Jan. 9	30	36	38	83	83	24	33	76					
Jan. 23	33	70	41	148	43	37	64	126	73	64	71	76	98
Feb. 6	75	76	71	97	66	52	50	105					
Feb. 20	82	42	98	82	51	35	56	83	63	63	67	70	84
MEAN	47	48	52	70	55	41	57	70	61	58	69	66	70
RANGE	16-109	20-77	21-104	15-148	25-104	11-133	12-120	25-158	23-82	13-100	35-118	37-84	47-98

Table C-22
BASEFLOW WATER QUALITY DATA

Specific Conductance (μmho/cm)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	40	138	56	145	71	36	62	161					
Mar. 26	50	145	59	133	71	50	68	145	136	133	326	290	288
Apr. 11	50	125	38	230	70	50	110	245					
Apr. 25	35	72	61	62	31	38	40	138	230	150	285	229	325
May 9	50	139	58	180	75	51	105	170					
May 23	43	140	45	150	68	46	85	195	179	165	300	300	560
SUMMER													
Jun. 6	50	98	72	100	55	40	70	188					
Jun. 20	55	151	109	229	128	57	115	249	158	157	271	275	316
Jul. 11	80	145	63	345	188	79	185	212					
Jul. 26	110	150	125	265	155	100	205	225	185	-	313	327	407
Aug. 8	65	145	95	210	100	60	185	190					
Aug. 22	73	136	111	152	153	69	160	200	187	346	321	347	507
FALL													
Sep. 5	50	110	45	95	80	35	92	225					
Sep. 17	50	135	50	110	70	90	115	225	152	170	316	323	473
Oct. 3	45	130	55	230	55	50	140	175					
Oct. 17	60	120	80	120	60	60	140	175	165	210	330	-	-
Nov. 7	50	115	45	305	105	60	95	195					
Nov. 21	50	100	50	195	80	50	90	155	150	170	330	400	310
WINTER													
Dec. 12	30	110	30	70	50	40	70	125					
Dec. 26	38	50	40	70	50	30	80	125	135	137	267	285	250
Jan. 9	40	130	35	225	40	45	65	198					
Jan. 23	35	100	35	180	45	35	55	180	125	126	193	216	280
Feb. 6	30	120	30	80	40	30	40	140					
Feb. 20	35	100	40	175	60	35	60	185	135	125	208	208	286
MEAN	51	121	59	169	79	52	101	184	161	172	288	291	364
RANGE	30-110	50-150	30-125	62-345	40-188	30-100	40-205	125-249	125-230	126-346	193-330	216-400	250-560

Table C-23
BASEFLOW WATER QUALITY DATA
Selected Minerals (mg/l)

MINERAL & SAMPLING DATE	STATION NUMBER 1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SODIUM													
Oct. 17	2.6	10.8	7.6	7.2	2.4	2.4	17.0	11.2	7.6	9.6	24.0	22.5	27.0
Dec. 26	3.6	4.0	3.2	4.2	3.8	2.8	7.6	12.0	12.0	10.0	27.0	24.0	24.0
Feb. 20	11.0	14.0	8.4	12.0	7.5	6.3	5.1	22.0	13.0	8.1	17.0	20.0	25.0
CHLORIDE													
Oct. 17	11.9	10.2	14.9	12.3	11.3	7.3	15.0	14.7	23.0	34.0	73.0	90.0	108.0
Dec. 26	3.4	3.7	4.4	5.2	5.1	3.2	7.6	13.0	10.0	11.0	56.0	50.0	47.0
Feb. 20	8.9	5.9	8.3	15.0	10.0	4.1	5.6	14.0	20.0	17.0	35.0	41.0	61.0
SULFATE													
Oct. 17	12.5	4.3	13.1	13.9	8.4	6.9	4.9	10.1	13.9	18.5	23.5	22.8	22.4
Dec. 26	18.0	16.0	16.0	10.0	16.0	12.0	25.0	23.0	21.0	18.0	15.0	17.0	16.0
Feb. 20	< 2.0	8.2	3.8	11.0	6.6	< 2.0	5.9	10.1	3.3	6.9	2.9	4.1	6.1
IRON													
Oct. 17	3.7	0.6	1.8	1.8	0.8	4.5	2.0	1.6	0.6	0.4	0.1	0.1	0.1
Dec. 26	1.8	7.2	2.0	3.6	1.9	1.6	1.7	2.8	2.5	0.3	0.4	0.4	1.0
Feb. 20	0.9	1.0	2.5	5.0	2.4	1.4	1.5	3.6	0.9	0.4	4.0	0.8	1.1
MANGANESE													
Oct. 17	1.3	0.06	0.40	1.10	0.15	0.60	0.55	0.25	0.22	0.20	0.15	0.12	0.06
Dec. 26	0.05	0.05	0.10	0.20	0.05	0.05	0.05	2.0	0.10	0.05	0.10	0.10	0.05
Feb. 20	0.07	0.05	0.12	1.0	0.07	0.10	0.10	0.40	0.07	<0.05	0.15	0.12	0.07

Table C-24
BASEFLOW WATER QUALITY DATA
EDTA Hardness (mg/l $CaCO_3$)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	19	30	18	52	20	25	20	45					
Mar. 26	16	27	17	58	25	14	23	39	97	50	111	102	99
Apr. 11	18	29	20	92	25	16	32	36					
Apr. 25	13	24	14	24	19	12	14	37	49	46	97	80	98
May 9	14	26	18	65	25	16	31	30					
May 23	13	28	15	49	23	14	23	31	47	46	86	80	115
SUMMER													
Jun. 6	20	26	12	36	20	11	22	57					
Jun. 20	14	34	18	66	37	15	31	65	42	42	67	71	81
Jul. 11	31	27	21	105	54	24	50	46					
Jul. 26	47	32	24	96	45	29	50	49	50	88	83	86	116
Aug. 8	25	26	20	64	26	19	38	114					
Aug. 22	26	25	21	45	42	28	64	45	40	116	74	92	126
FALL													
Sep. 5	20	35	16	36	14	17	22	79					
Sep. 17	14	28	16	40	20	17	25	74	47	57	93	95	118
Oct. 3	22	30	23	84	23	23	40	58					
Oct. 17	29	29	25	47	24	25	40	51	54	67	106	106	104
Nov. 7	17	29	22	92	36	22	28	72					
Nov. 21	16	27	18	74	32	18	27	61	48	58	111	102	96
WINTER													
Dec. 12	14	30	18	33	20	16	22	50					
Dec. 26	20	31	18	40	22	21	27	48	55	52	107	102	81
Jan. 9	16	26	18	110	110	17	25	78					
Jan. 23	16	31	17	94	21	18	24	72	49	48	85	82	94
Feb. 6	14	27	16	45	13	16	19	67					
Feb. 20	15	28	16	84	21	14	22	68	44	48	80	76	93
MEAN	20	29	18	64	30	19	30	57	52	60	92	90	102
RANGE	13-47	24-35	12-25	24-105	14-110	11-29	20-64	30-114	40-97	42-116	67-111	80-106	81-126

Table C-25
BASEFLOW WATER QUALITY DATA

Calcium Hardness (mg/l $CaCO_3$)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	4.7	23.0	10.0	40.0	19.0	29.0	12.0	54.0					
Mar. 26	8.2	19.0	9.8	42.0	16.0	8.2	14.0	24.0	34.0	38.0	74.0	66.0	65.0
Apr. 11	11.0	24.0	12.0	58.0	16.0	9.0	24.0	29.0					
Apr. 25	6.5	16.0	7.2	16.0	7.5	6.0	8.5	25.0	38.0	38.0	60.0	52.0	63.0
May 9	8.0	22.0	11.0	46.0	15.0	8.2	20.0	23.0					
May 23	7.0	21.0	10.0	36.0	18.0	8.8	14.0	24.0	35.0	35.0	65.0	60.0	78.0
SUMMER													
Jun. 6	8.8	23.0	9.2	27.0	13.0	7.8	14.0	46.0					
Jun. 20	8.5	27.0	7.5	50.0	26.0	8.8	20.0	53.0	34.0	32.0	50.0	58.0	66.0
Jul. 11	21.0	19.0	12.0	84.0	34.0	32.0	18.0	34.0					
Jul. 26	35	24	17	68	32	21	37	37	40	76	82	79	106
Aug. 8	16	18	12	42	17	12	32	29					
Aug. 22	22	18	14	34	30	17	35	34	30	104	70	72	97
FALL													
Sep. 5	10.0	22.5	8.8	25.5	11.8	6.2	14.8	60					
Sep. 17	11	19	9	26	12	9	18	55	35	42	68	72	80
Oct. 3	9.8	20.0	12.0	68.0	11.5	12.2	21.5	41.2					
Oct. 17	16.2	18.0	14.5	40.0	13.0	14.0	27.5	40.0	42.5	60.0	77.5	77.5	75.0
Nov. 7	7.5	20	9.5	60	20	8.75	15	55					
Nov. 21	9.5	17.5	10.8	31.8	17.2	9.2	15.8	37.2	22.5	26.8	37.5	67	32.8
WINTER													
Dec. 12	6.8	18	8.0	20	12	7.8	13	36					
Dec. 26	5.2	15	6.2	20	10	5.2	12	32	31	29	61	53	44
Jan. 9	7.2	20	9.0	77	77	7.8	15	61					
Jan. 23	6.5	24	7.8	61	9.5	7.2	12	51	36	38	54	52	60
Feb. 6	5.5	18	6.8	24	8.0	6.0	8.5	46					
Feb. 20	7.0	20	8.8	55	12	7.2	13	47	36	33	54	51	61
MEAN	11	20	10	43.8	19.1	11.2	18.1	40.6	34.5	45.9	62.8	63.3	68.9
RANGE	4.7-35	15-27	6.2-14.5	16-84	7.5-77	6.0-32	8.5-37	23-61	22.5-42.5	26.8-104	37.5-82	52-79	32.8-106

Table C-26
BASEFLOW WATER QUALITY DATA

Oil and Grease (mg/1)

SAMPLING DATE	STATION NUMBER												
	1	2	3	4	5	6	7	8	9a	9b	10a	10b	10c
SPRING													
Mar. 12	-	0.00	0.00	0.00	0.00	0.00	1.40	3.10					
Mar. 26	0.10	0.00	0.40	1.30	0.00	0.10	0.40	1.10	0.10	0.30	0.10	0.80	0.10
Apr. 11	5.30	0.45	7.30	0.00	0.76	0.18	3.40	1.60					
Apr. 25	2.40	2.00	2.40	2.00	3.10	4.00	1.50	4.30	4.50	1.90	6.20	3.00	5.00
May 9	1.10	2.00	6.50	5.20	3.40	2.80	8.10	4.70					
May 23	1.00	0.20	0.00	8.10	3.50	0.20	0.20	0.00	0.00	0.70	0.20	0.20	0.00
SUMMER													
Jun. 6	1.80	1.60	1.60	1.80	1.50	1.80	0.90	2.10					
Jun. 20	0.00	0.80	-	0.00	0.40	0.80	0.00	0.50	0.80	1.10	0.00	0.00	0.00
Jul. 11	0.00	0.30	0.60	0.70	0.20	1.30	0.00	0.30					
Jul. 26	2.7	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	1.7	0.0	0.0	0.0
Aug. 8	1.8	2.8	0.0	1.8	0.5	2.7	5.8	1.0					
Aug. 22	0.0	1.2	0.5	18.1	15.2	0.9	1.8	1.0	-	1.3	1.2	1.0	0.0
FALL													
Sep. 5	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0					
Sep. 17	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.5	0.0	0.0	0.0	0.3
Oct. 3	0.0	1.0	0.0	4.6	0.0	0.0	0.0	0.0					
Oct. 17	0.0	9.3	0.0	18.0	0.0	8.4	0.0	0.0	1.2	0.0	0.0	4.4	1.1
Nov. 7	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0					
Nov. 21	0.0	1.6	0.5	1.0	0.0	2.6	0.0	0.0	1.0	0.0	0.0	1.9	0.0
WINTER													
Dec. 12	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.2					
Dec. 26	0.0	0.2	0.0	0.0	0.0	0.0	0.8	0.2	0.0	0.0	1.2	0.0	0.0
Jan. 9	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.2					
Jan. 23	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	1.5	0.0
Feb. 6	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0					
Feb. 20	0.0	3.1	0.0	0.4	0.6	0.0	4.0	3.5	2.3	0.0	0.0	0.0	2.1
MEAN	0.79	1.11	0.86	2.75	1.23	1.15	1.18	0.99	0.86	0.6	0.74	1.07	0.72
RANGE	0.00-5.3	0.00-9.3	0.00-7.30	0.00-18.0	0.00-15.2	0.00-8.4	0.00-8.10	0.00-4.70	0.00-37.1	0.00-1.90	0.00-6.20	0.00-4.4	0.00-5.0

Table C-27
Seasonal Water Temperatures and Dissolved Oxygen Profiles: Station 9a
Spring, 1974

DATE	DEPTH (From Top)	TEMPERATURE (^{o}C)	D.O. (mg/l) METER
March 27	Surface	14.6	8.5
	1'	13.9	8.7
	2'	12.0	9.1
	3'	12.0	8.8
	4'	11.9	7.5
April 25	Surface	24.0	9.7
	1'	23.0	10.0
	2'	22.1	9.6
	4'	21.5	8.6
May 23	Surface	29.5	10.8
	1'	29.5	10.8
	2'	29.4	10.6
	3'	29.4	10.6

Table C-28
Seasonal Water Temperatures and Dissolved Oxygen Profiles: Station 9a
Summer, 1974

DATE	DEPTH (From Top)	TEMPERATURE (^{o}C)	D.O. (mg/l) METER
June 20	Surface	29.2	9.3
	1'	28.7	9.4
	2'	28.2	9.4
	3'	27.8	8.8
July 25	0.5'	30.5	7.6
	3'	29.0	5.3
August 22	Surface	32.0	12.1
	1'	30.7	9.6
	3'	29.9	6.8

Table C-29
Seasonal Water Temperatures and Dissolved Oxygen Profiles: Station 9a
Fall, 1974

DATE	DEPTH (From Top)	TEMPERATURE (°C)	D.O. (mg/l) METER
September 17	Surface	25.8	12.9
	1'	25.8	12.3
	2'	25.3	11.7
	3'	25.1	9.2
October 17	Surface	22.5	10.6
	1'	22.0	10.6
	2'	21.0	10.6
	3'	19.5	9.4
	4'	19.0	5.7
	5'	19.0	5.2
November 21	Surface	15	7.2
	1'	15	7.6
	3'	13	10.6
	5'	14.5	10.1

Table C-30
Seasonal Water Temperatures and Dissolved Oxygen Profiles: Station 9a
Winter 1974-75

DATE	DEPTH (From Top)	TEMPERATURE (°C)	D.O. (mg/l) METER
December 26	Surface	9.0	5.8
	1'	9.0	5.8
	3'	9.0	5.9
	6'	9.0	5.9
January 23	Surface	9.5	11.9
	1'	9.0	11.9
	3'	7.0	11.6
	5'	7.0	9.3
	9'	7.0	8.2
February 20	Surface	12.0	11.3
	1'	12.0	11.3
	3'	11.0	11.3
	6'	10.0	10.4
	9'	9.5	9.5
	11'	9.5	9.1

Table C-31
Seasonal Water Temperatures and Dissolved Oxygen Profiles: Station 9b
Spring, 1974

DATE	DEPTH (From Top)	TEMPERATURE (°C)	D.O. (mg/l) METER
March 27	Surface	14.3	10.8
	1'	14.0	10.8
	4'	13.6	10.4
	7'	11.9	8.8
	10'	11.0	7.7
	13'	11.0	7.3
	14'	10.9	7.4
April 25	Surface	21.2	10.0
	1'	21.0	10.1
	3'	19.8	8.3
	6.5'	19.5	7.8
May 23	Surface	27.8	10.6
	1'	27.4	10.6
	3'	25.5	8.5
	5'	25.2	7.6

Table C-32
Seasonal Water Temperatuers and Dissolved Oxygen Profiles: Station 9b
Summer, 1974

DATE	DEPTH (From Top)	TEMPERATURE (°C)	D.O. (mg/l) METER
June 20	Surface	30.0	10.6
	3'	29.3	10.6
	6'	28.0	8.25
	9'	27.2	5.45
July 25	Surface	31.0	11.7
	1'	30.8	11.6
	2'	30.7	11.6
August 22	Surface	31.9	13.2
	1'	31.5	12.5
	2'	31.0	11.7

Table C-33
Seasonal Water Temperatures and Dissolved Oxygen Profiles: Station 9b
Fall, 1974

DATE	DEPTH (From Top)	TEMPERATURE (°C)	D.O. (mg/l) METER
September 17	Surface	25.5	12.6
	1'	25	11.8
	2'	25	11.6
October 17	Surface	23.8	10.6
	1'	22.9	10.2
	2'	21.0	8.7
	3'	19.1	4.4
November 21	Surface	13.5	11.4
	1'	13.5	11.2
	3'	13.0	11.2
	6'	13.0	10.9
	7'	13.0	10.2

Table C-34
Seasonal Water Temperatures and Dissolved Oxygen Profiles: Station 9b
Winter 1974-75

DATE	DEPTH (From Top)	TEMPERATURE (°C)	D.O. (mg/l) METER
December 26	Surface	7.5	9.7
	1'	7.5	9.7
	3'	7.5	9.7
	6'	7.5	9.7
	8'	7.0	9.7
January 23	Surface	8.0	11.9
	1'	8.0	11.9
	3'	6.5	11.8
	6'	6.0	11.5
	9'	6.0	11.2
February 20	Surface	10.0	11.0
	1'	10.0	11.0
	3'	10.0	11.0
	6'	10.0	10.9
	9'	10.0	10.8
	10'	10.0	10.8

Table C-35
Seasonal Water Temperatures and Dissoved Oxygen Profiles: Station 10a
Spring, 1974

DATE	DEPTH (From Top)	TEMPERATURE (°C)	D.O. (mg/l) METER
March 27	Surface	14.5	11.5
	2'	12.0	10.5
	5'	11.2	10.3
	8'	11.0	10.3
	11'	10.9	10.3
	14'	10.8	10.3
	17'	10.7	10.2
	17.5'	10.7	10.1
April 25	Surface	21	10.5
	1'	20.8	10.5
	3'	19.5	10.1
	6'		9.2
	9'	18.7	7.7
	12'	18.2	5.0
May 23	Surface	27.2	10.3
	1'	26.6	10.2
	3'	25.1	9.3
	6'	25	7.8
	9'	24.4	5.0
	12'	24.1	1.8

Table C-36
Seasonal Water Temperatures and Dissolved Oxygen Profiles: Station 10a
Summer, 1974

DATE	DEPTH (From Top)	TEMPERATURE (°C)	D.O. (mg/l) METER
June 20	Surface	28.6	10.6
	3'	28.2	10.5
	6'	27.9	10.5
	9'	26.7	7.2
	12'	26.0	5.9
	15'	24.8	5.1
July 25	Surface	31	11.0
	1'	31	10.9
	3'	30	11.3
	6'	29.5	7.0
	9'	29.5	5.5
	12'	30	0.7
August 22	Surface	31.5	15.7
	1'	30.3	17.1
	3'	29.8	15.4
	6'	29.2	14.5
	9'	27.3	1.4
	12'	27.2	0.4

Table C-37
Seasonal Water Temperatures and Dissolved Oxygen Profiles: Station 10a
Fall, 1974

DATE	DEPTH (From Top)	TEMPERATURE (°C)	D.O. (mg/l) METER
September 17	Surface	24.0	11.2
	1'	23.8	11.3
	3'	23.0	10.6
	6'	22.3	9.4
	9'	22.2	7.8
	12'	22.1	7.4
October 17	Surface	20.0	11.6
	1'	20.0	11.6
	3'	19.0	11.2
	6'	18.5	9.7
	9'	18.5	9.2
	12'	18.5	8.9
November 21	Surface	14.0	11.2
	1'	14.0	11.1
	3'	14.0	11.2
	6'	13.5	11.1
	9'	14.0	11.1
	12'	14.0	11.0
	13'	14.0	11.1

Table C-38
Seasonal Water Temperatures and Dissolved Oxygen Profiles: Station 10a
Winter 1974-75

DATE	DEPTH (From Top)	TEMPERATURE (°C)	D.O. (mg/l) METER
December 26	Surface	8.0	10.6
	1'	8.0	10.6
	3'	8.0	10.6
	6'	8.0	10.5
	9'	8.0	10.6
	12'	8.0	10.8
January 23	Surface	7.5	14.3
	1'	7.5	14.2
	3'	7.0	14.2
	6'	6.5	12.6
	9'	7.0	12.2
	12'	7.5	11.9
February 20	Surface	9.5	13.5
	1'	9.5	13.5
	3'	9.5	13.5
	6'	9.5	13.4
	9'	9.0	13.2
	12'	9.0	12.6
	13'	9.0	12.4

Table C-39
Seasonal Water Temperatures and Dissolved Oxygen Profiles: Station 10b
Spring, 1974

DATE	DEPTH (From Top)	TEMPERATURE (°C)	D.O. (mg/l) METER
March 27	1'	14.0	12.2
	4'	13.8	12.0
	7'	12.8	11.5
	10'	12.2	8.4
	13'	12.0	8.3
	16'	11.9	8.2
	19'	11.7	8.2
April 25	Surface	20.5	9.5
	1'	20.3	9.5
	3'	19.5	8.6
	6'	19.0	8.0
	9'	18.9	7.7
	12'	18.5	7.2
	15'	18.2	6.9
	18'	18.2	6.9
	21'	18.0	5.0
	24'	17.5	3.0
May 23	Surface	27.2	11.9
	1'	26.9	11.8
	3'	25.2	9.4
	6'	25.0	7.5
	9'	24.9	6.05
	12'	24.8	5.6
	16'	24.3	2.3

Table C-40
Seasonal Water Temperatures and Dissolved Oxygen Profiles: Station 10b
Summer, 1974

DATE	DEPTH (From Top)	TEMPERATURE (°C)	D.O. (mg/l) METER
June 20	Surface	27.0	7.3
	3'	25.9	6.75
	6'	25.2	4.3
	9'	24.9	3.4
	12'	24.8	2.6
	15'	24.6	1.75
July 25	Surface	31.0	11.5
	1'	30.0	11.0
	3'	29.0	7.5
	6'	29.0	5.1
	9'	29.0	3.6
	12'	29.0	2.6
	15'	28.5	1.0
	18'	28.5	0.2
August 22	Surface	32.0	14.9
	1'	31.2	17.2
	3'	29.9	16.8
	6'	28.4	5.6
	9'	28.1	2.0
	12'	28.0	0.7
	15'	27.8	0.3
	18'	27.6	0.2

Table C-41
Seasonal Water Temperatures and Dissoved Oxygen Profiles: Station 10b
Fall, 1974

DATE	DEPTH (From Top)	TEMPERATURE (°C)	D.O. (mg/l) METER
September 17	Surface	24.9	12.8
	1'	24.8	12.6
	3'	24.1	12.4
	6'	24.0	11.9
	9'	23.4	10.2
	12'	23.2	8.4
	15'	23.0	6.2
	18'	22.7	2.2
October 17	Surface	20.0	11.9
	1'	20.0	11.9
	3'	19.0	11.6
	6'	18.5	9.1
	9'	18.5	8.5
	12'	18.0	8.0
	15'	18.0	8.0
	18'	18.0	8.0
	21'	18.5	7.7
	24'	18.5	7.5
November 21	Surface	13	9.2
	1'	13	9.1
	3'	13	9.1
	6'	13	9.1
	9'	13	9
	12'	13	8.8
	15'	13.5	8.8
	18'	13.5	8.7
	21'	13.5	8.5
	24'	13.5	8.3
	26'	14	7.8

Table C-42
Seasonal Water Temperatures and Dissolved Oxygen Profiles: Station 10b
Winter, 1974-75

DATE	DEPTH (From Top)	TEMPERATURE (°C)	D.O. (mg/l) METER
December 26	Surface	8.0	10.1
	1'	8.0	10.1
	3'	8.0	10.0
	6'	8.0	10.1
	9'	8.0	10.1
	12'	8.0	10.0
	15'	8.0	10.0
	18'	8.0	10.0
	21'	8.0	9.8
	24'	8.0	9.8
	26'	7.5	9.7
January 23	Surface	8.0	12.7
	1'	8.0	12.6
	3'	7.0	12.3
	6'	6.5	12.2
	9'	6.5	12.1
	12'	6.5	12.0
	15'	6.5	11.9
	18'	6.5	11.9
	21'	6.5	11.8
	24'	6.5	11.8
	26'	6.0	11.8
February 20	Surface	10.0	13.1
	1'	10.0	13.1
	3'	10.0	13.1
	6'	10.0	13.0
	9'	9.5	12.8
	13'	9.5	12.3
	15'	9.0	11.8
	18'	9.0	11.6

Table C-43
Seasonal Water Temperatures and Dissolved Oxygen Profiles: Station 10c
Spring, 1974

DATE	DEPTH (From Top)	TEMPERATURE (^{o}C)	D.O. (mg/l) METER
March 27	1'	14.4	12.4
	4'	14.2	12.2
	7'	14.0	12.0
	10'	12.5	9.8
	13'	12.2	8.5
April 25	Surface	20.2	11.8
	1'	20.1	11.8
	3'	19.9	11.2
	6'	18.5	9.8
	9'	18.0	8.8
	12'	18.0	8.5
	15'	18.0	8.25
	18'	17.8	7.6
	22'	17.5	6.8
May 23	Surface	28.0	10.7
	1'	28.0	10.8
	3'	26.3	9.6
	6'	24.8	7.2
	9'	24.1	6.7
	12'	24.0	7.0
	15'	24.0	6.7
	18'	23.1	3.5
	21'	23.0	2.9

Table C-44
Seasonal Water Temperatures and Dissolved Oxygen Profiles: Station 10c
Summer, 1974

DATE	DEPTH (From Top)	TEMPERATURE (°C)	D.O. (mg/1) METER
June 20	Surface	28.1	8.1
	3'	27.9	7.95
	6'	27.5	7.8
	9'	27.1	7.6
	12'	26.9	7.5
	15'	26.5	7.5
	18'	26.1	7.4
	21'	25.5	7.0
	24'	24.0	6.3
	27'	24.6	5.2
July 25	Surface	31.5	11.0
	1'	31.5	10.9
	3'	31	11.1
	6'	30.5	10.4
	9'	30.0	7.1
	12'	29.5	6.8
	15'	29.5	6.6
	18'	29	4.8
	21'	29	1.7
	24'	29	0.7
August 22	Surface	32.0	10.8
	1'	30.1	12.6
	3'	29.2	12.8
	6'	28.7	8.5
	9'	28.5	6.4
	12'	28.3	5.9
	15'	28.1	4.6
	18'	28.0	1.6
	21'	27.7	1.2

Table C-45
Seasonal Water Temperatures and Dissolved Oxygen Profiles: Station 10c
Fall, 1974

DATE	DEPTH (From Top)	TEMPERATURE ($^{\circ}C$)	D.O. (mg/l) METER
September 27	Surface	24.0	9.0
	1'	23.6	8.7
	3'	23.4	8.5
	6'	23.0	8.0
	9'	22.9	7.2
	12'	22.7	6.5
	15'	22.6	6.3
	18'	22.6	6.7
	21'	22.5	5.4
October 17	Surface	22.0	12.2
	1'	21.5	12.2
	3'	20.0	11.9
	6'	19.0	9.9
	9'	19.0	9.1
	12'	18.5	9.0
	15'	19.0	8.7
	18'	19.0	8.3
	21'	19.0	7.7
November 21	Surface	12.5	9.8
	1'	12.5	9.7
	3'	12.5	9.7
	6'	12.5	9.7
	9'	12.5	9.8
	12'	12.5	9.8
	15'	12.5	9.8
	18'	12.5	9.8
	21'	12.5	9.7
	23'	13	9.4

Table C-46
Seasonal Water Temperatures and Dissolved Oxygen Profiles: Station 10c
Winter, 1974-75

DATE	DEPTH (From Top)	TEMPERATURE (^{o}C)	D.O. (mg/l) METER
December 26	Surface	7.5	10.7
	1'	7.5	10.7
	3'	7.5	10.7
	6'	7.5	10.7
	9'	7.5	10.9
	12'	7.0	10.9
	15'	7.0	10.9
	18'	7.0	10.9
	21'	7.0	11.0
	24'	7.0	10.6
January 23	Surface	7.0	12.2
	1'	7.0	12.2
	3'	6.0	12.0
	6'	6.0	12.1
	9'	6.0	12.1
	12'	5.5	12.3
	15'	5.0	12.3
	18'	5.0	12.2
	21'	5.0	12.2
February 20	Surface	9.0	12.5
	1'	9.0	12.5
	3'	9.0	12.5
	6'	9.0	12.5
	9'	8.5	12.5
	12'	8.0	12.4
	15'	8.0	12.2
	18'	8.0	12.1
	21'	8.0	12.1

STORMWATER QUALITY

STATION 1

STORM EVENTS:

——————— December 6 - 7, 1974

- - - - - - - February 22 - 23, 1975

Figure C-1
Biochemical and Chemical Oxygen Demands

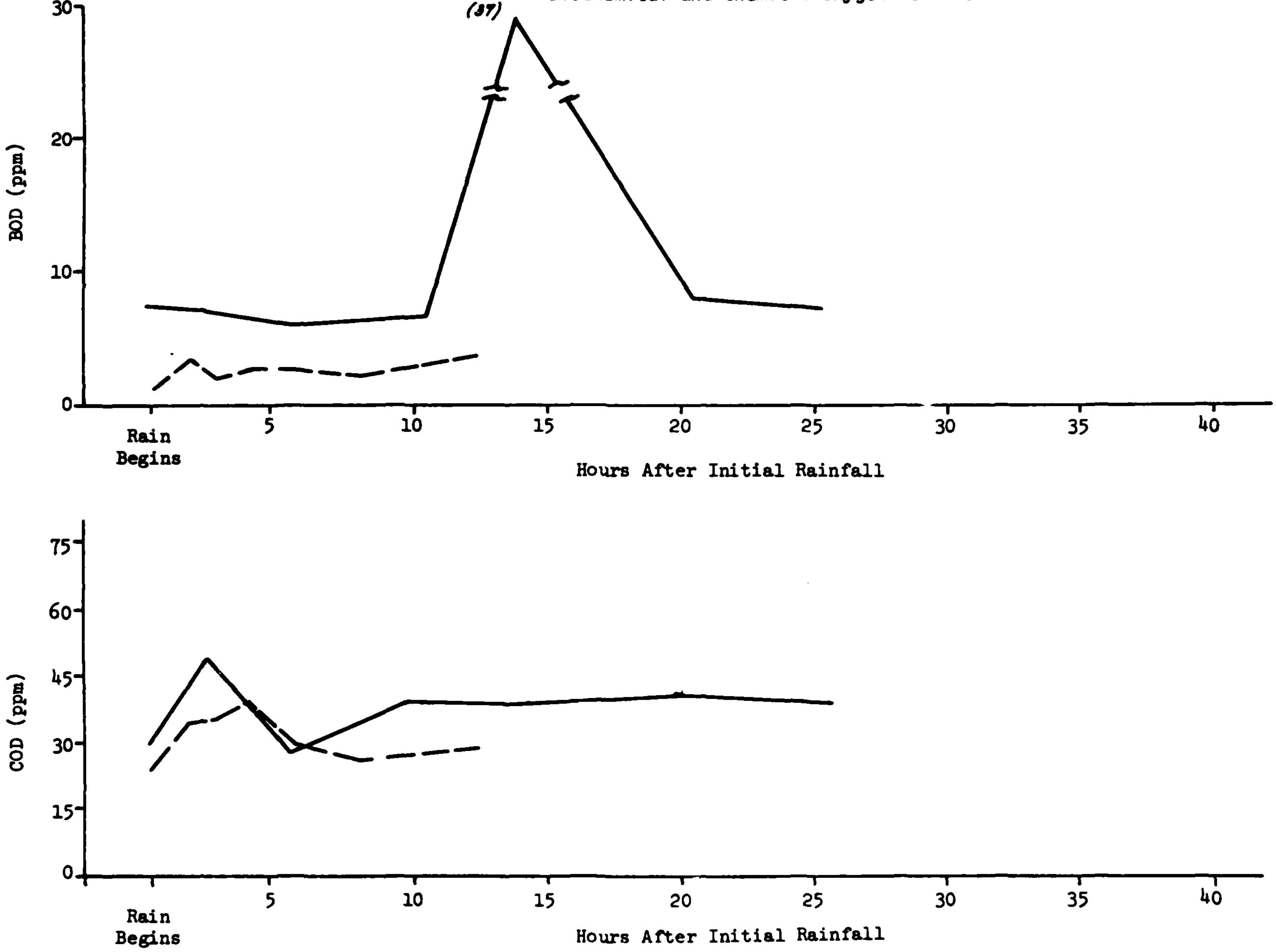


Figure C-2
Fecal Bacteria

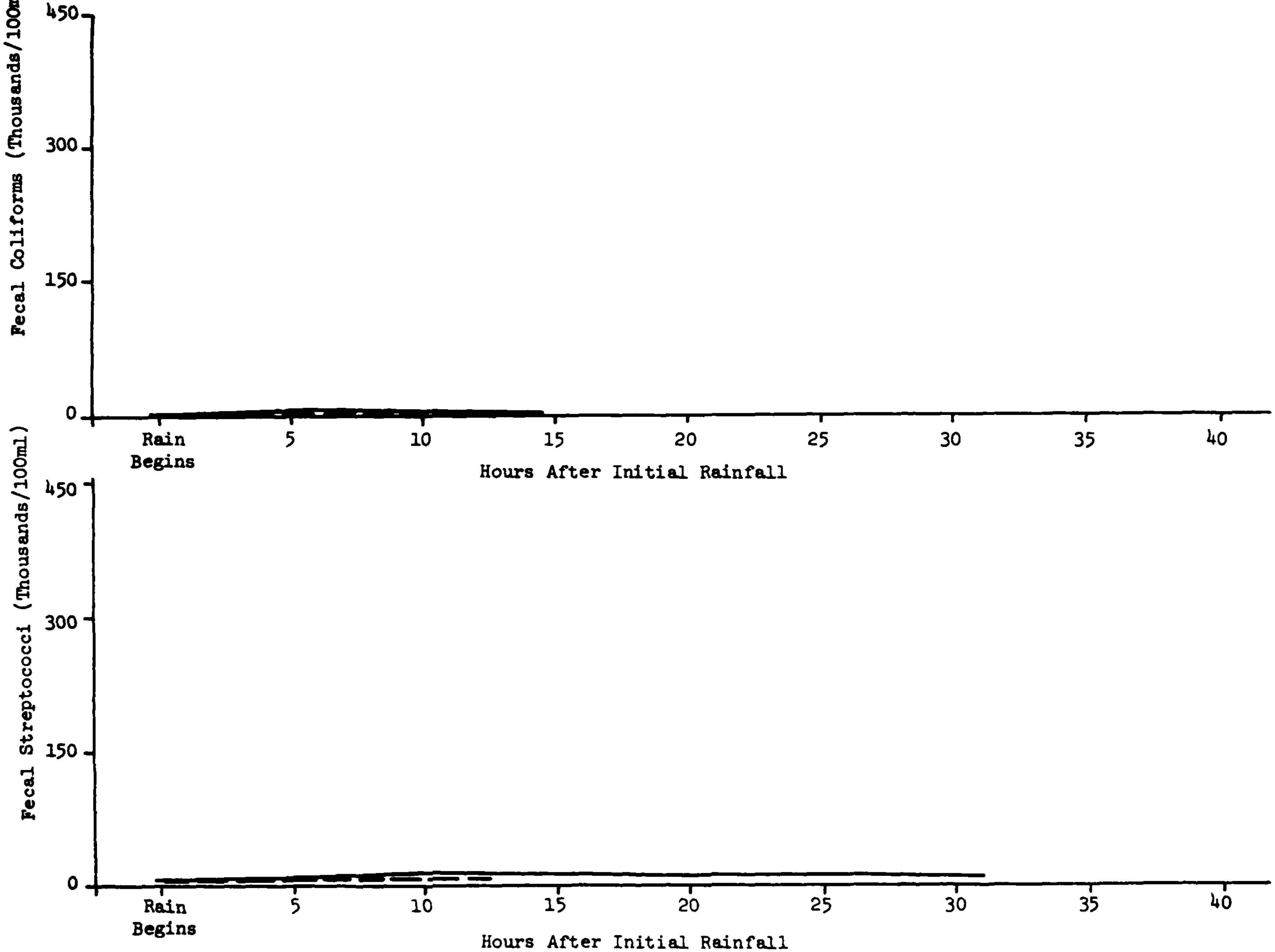


Figure C-3
Ammonia and Kjeldahl Nitrogen

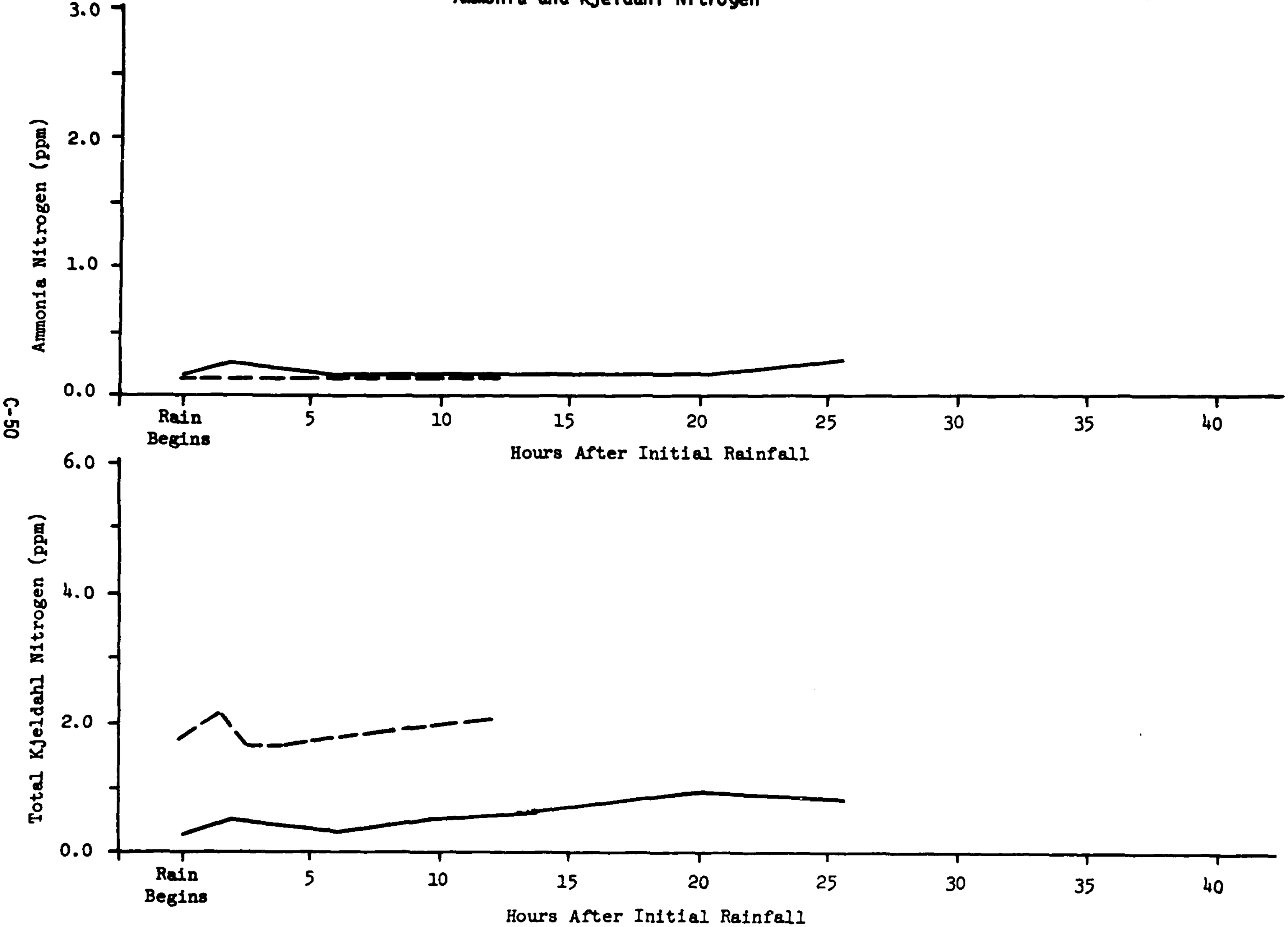


Figure C-4
Suspended Solids and Total Phosphorus

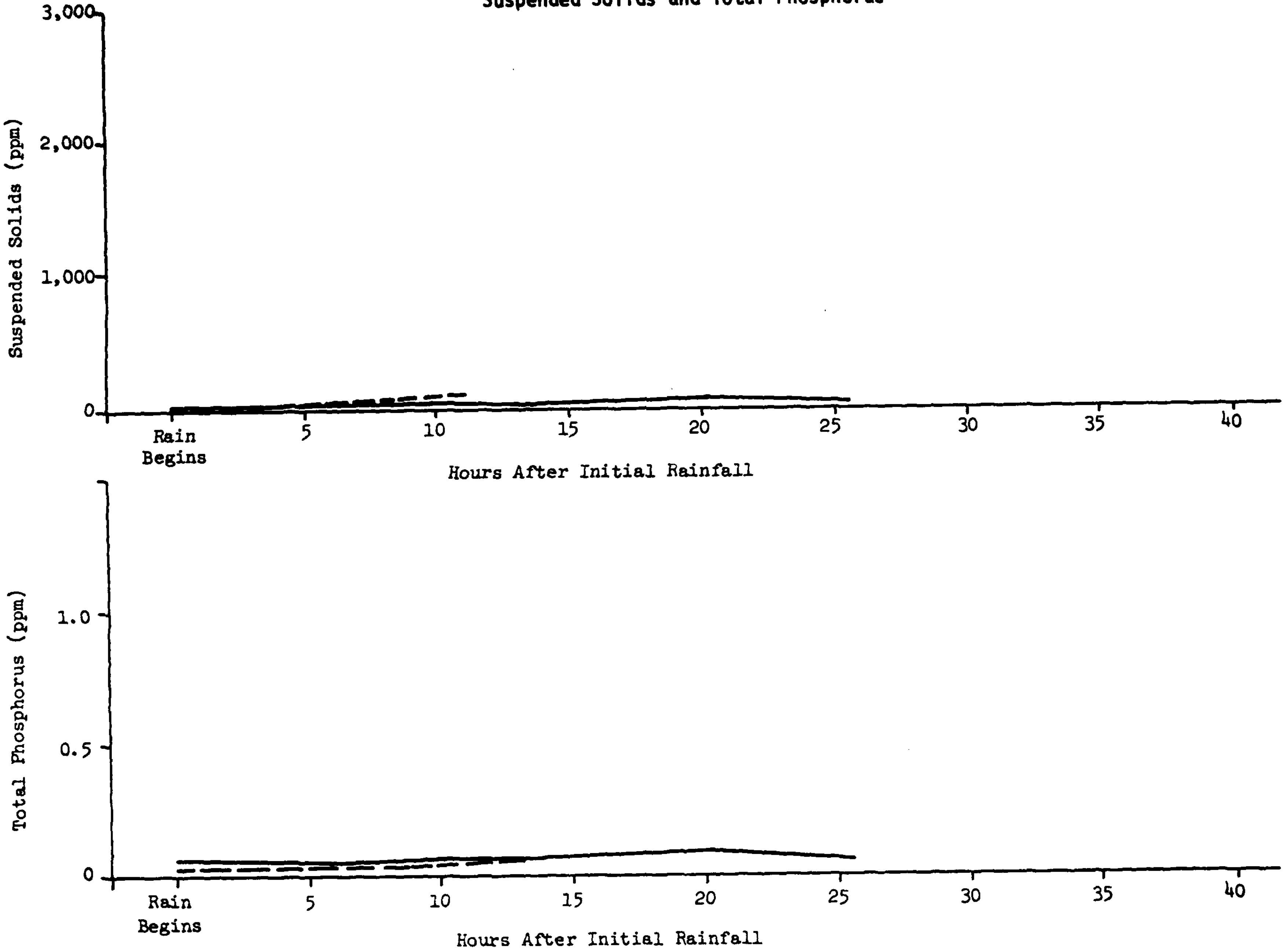
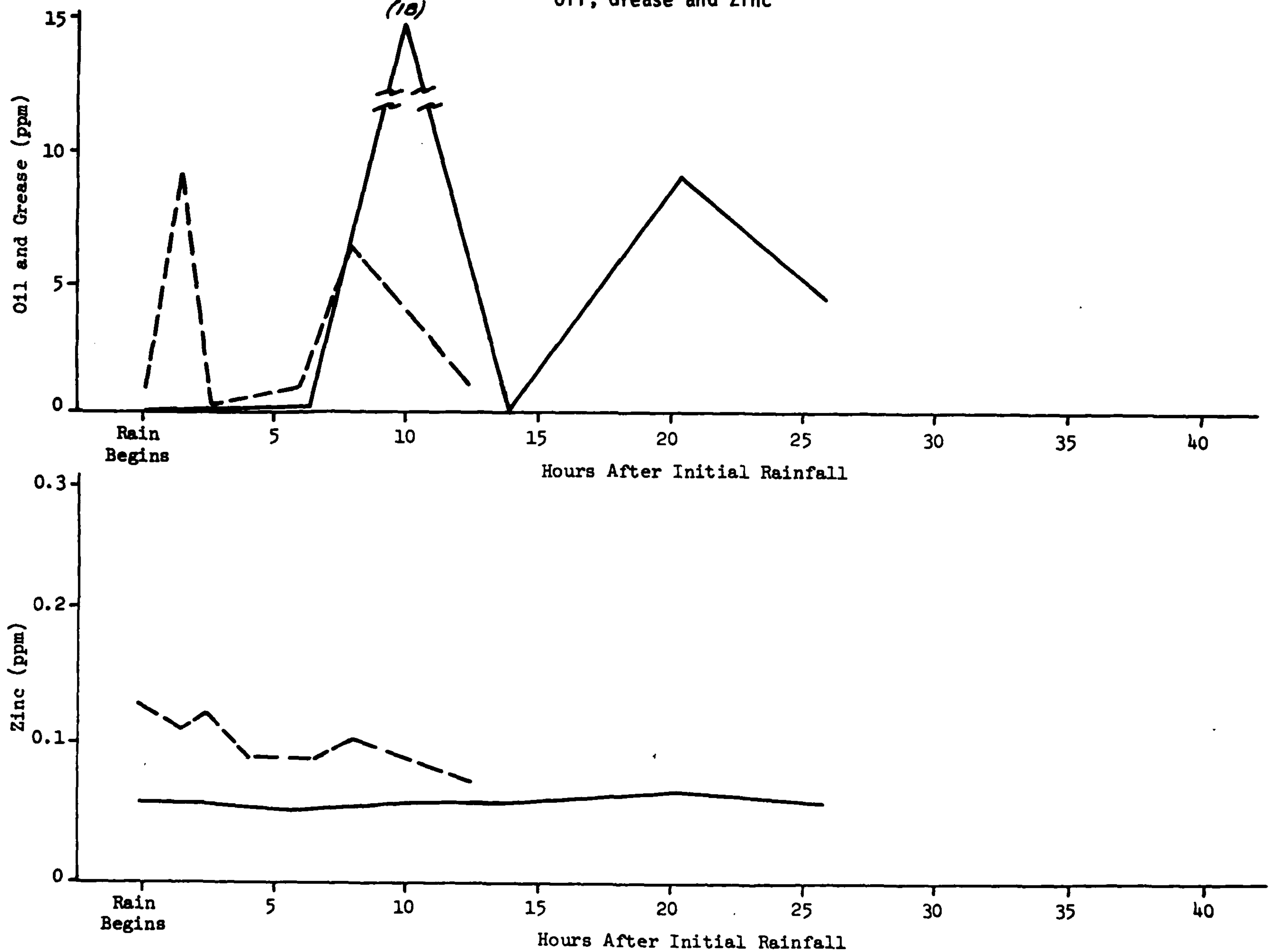


Figure C-5
Oil, Grease and Zinc



STORMWATER QUALITY

STATION 2

STORM EVENTS:

———————	May 14 - 15, 1974
— — — — — —	July 25 - 26, 1974
— · ——— · ——	December 5 - 6, 1974
— · · ——— · · ——	February 22 - 23, 1975

Figure C-6
Biochemical and Chemical Oxygen Demands

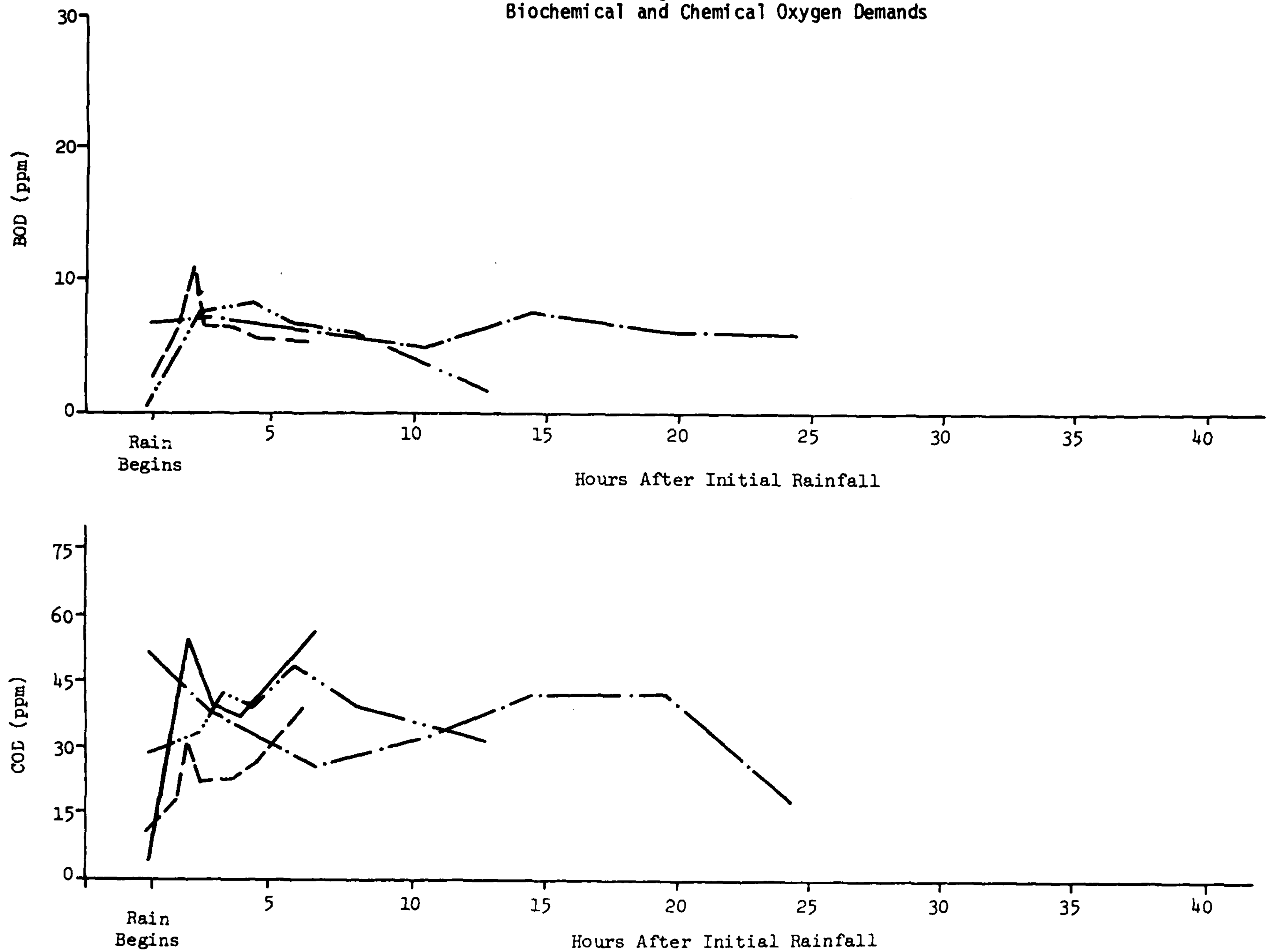


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Figure C-7
Fecal Bacteria

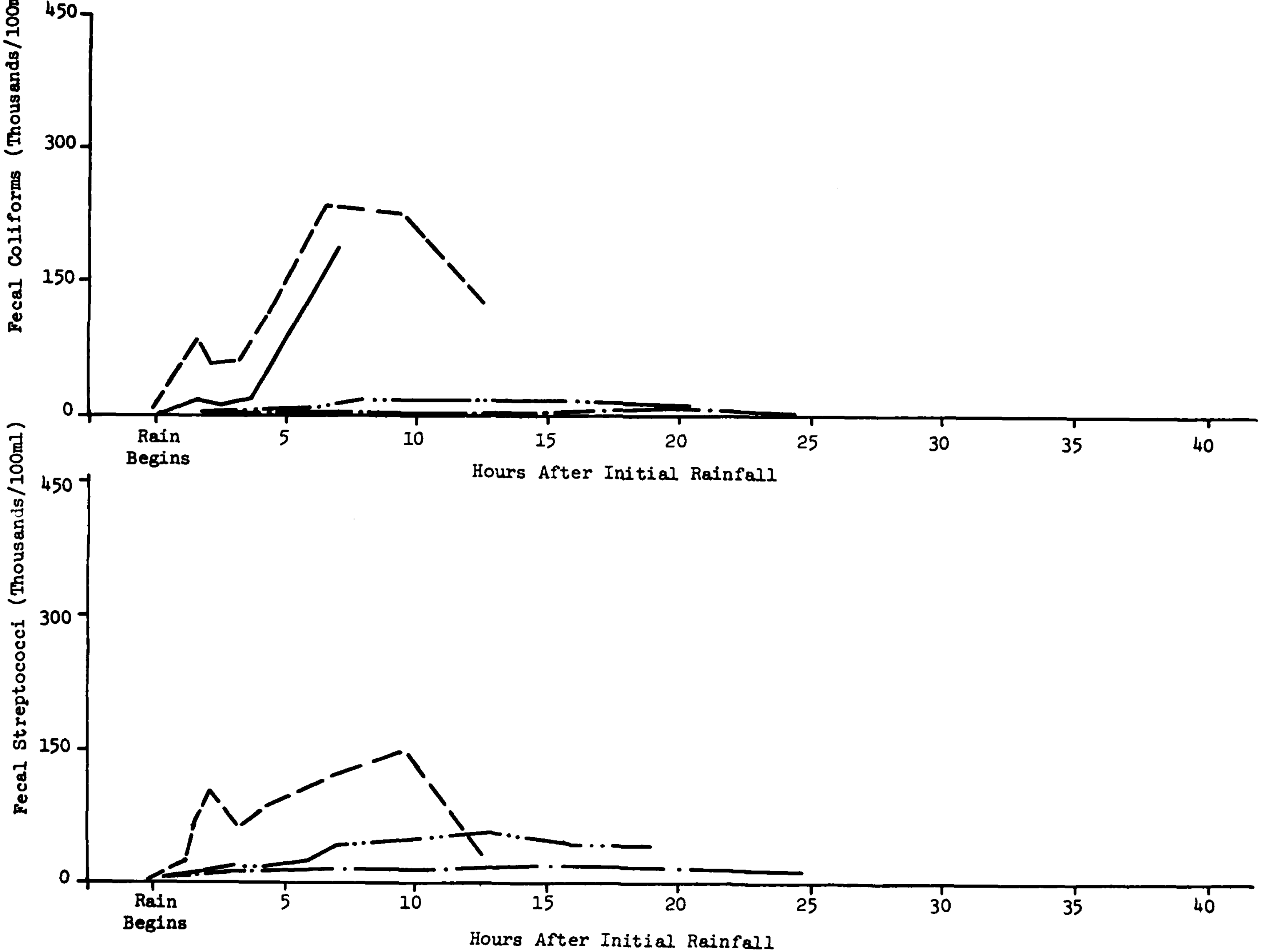


Figure C-8
Ammonia and Kjeldahl Nitrogen

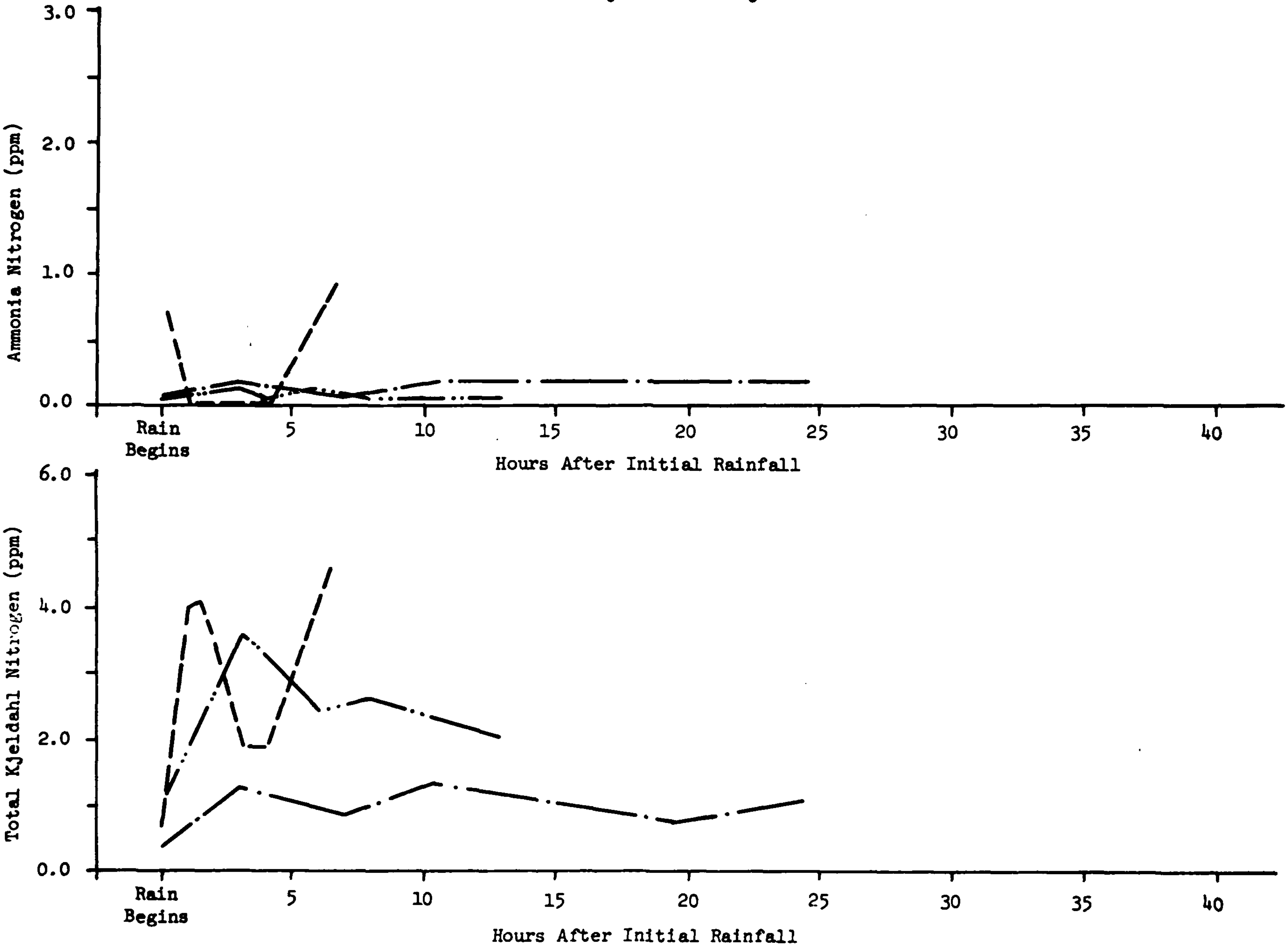
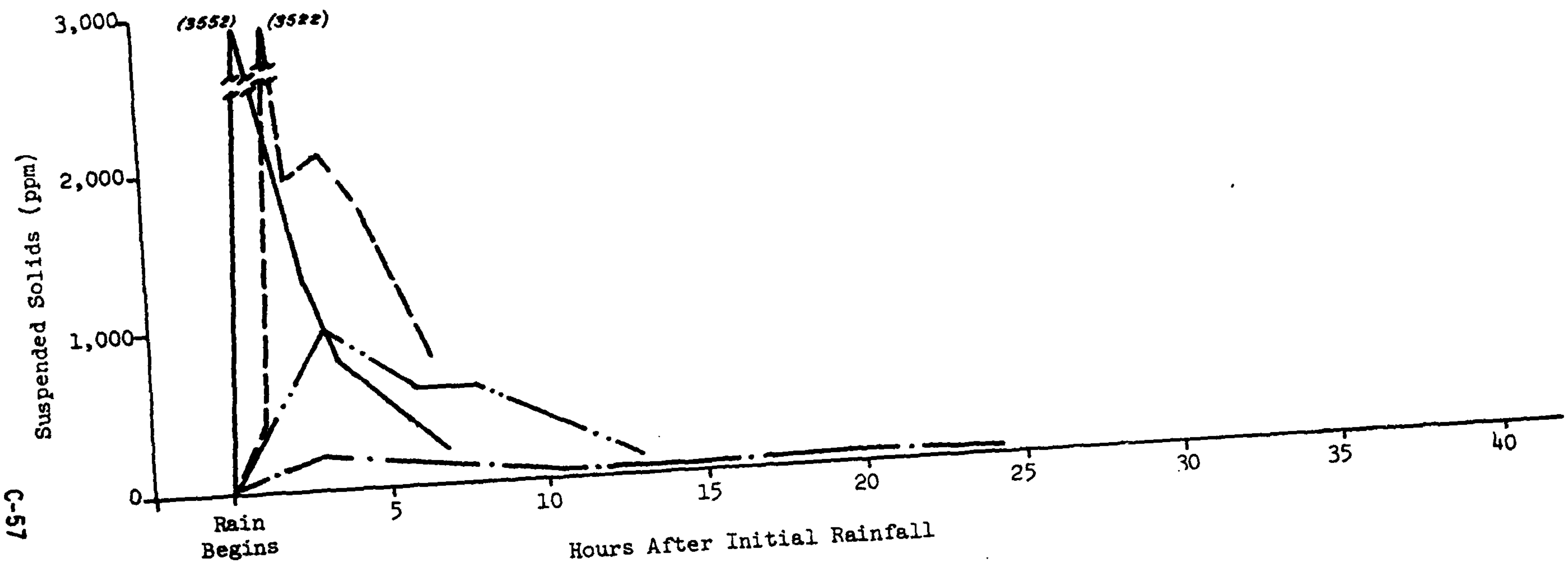


Figure C-9
Suspended Solids and Total Phosphorus



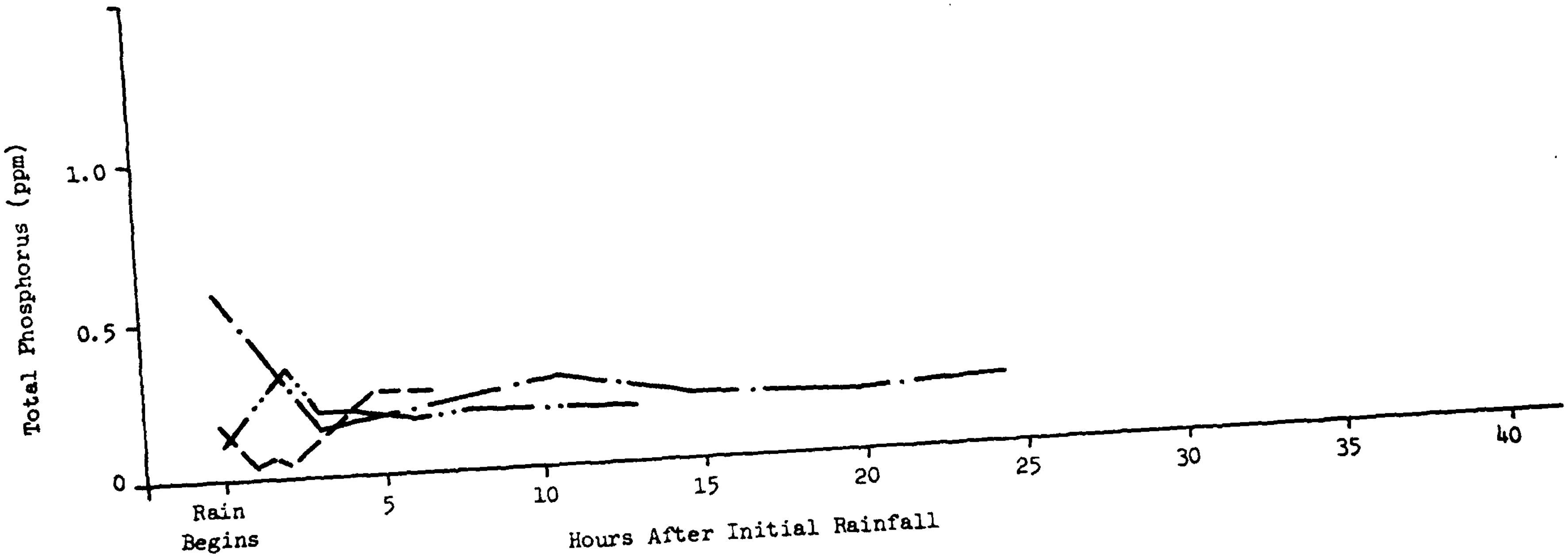
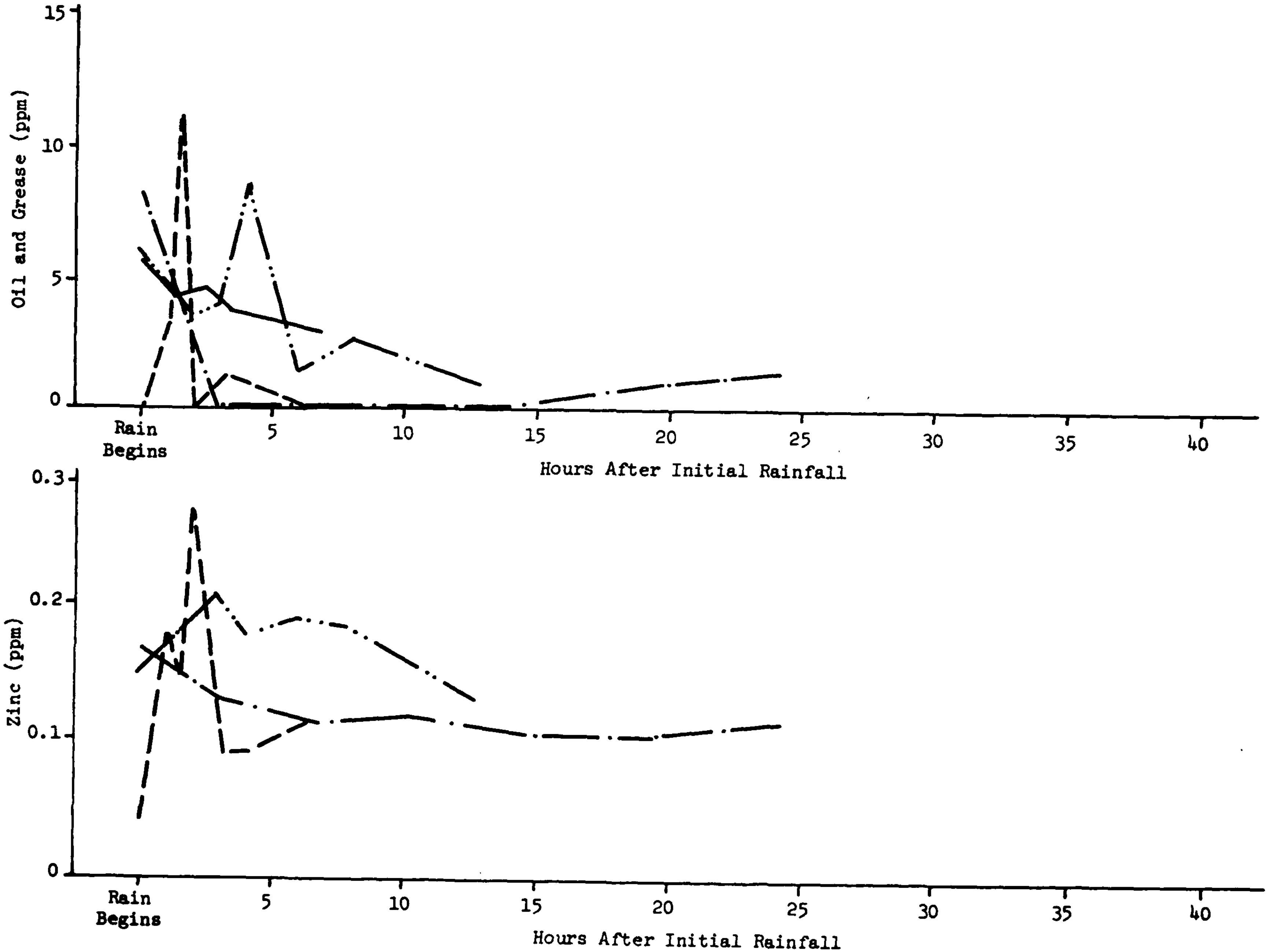


Figure C-10
Oil, Grease and Zinc



STORMWATER QUALITY

STATION 3

STORM EVENTS:

——————— May 14 - 15, 1974

— — — — July 24 - 25, 1974

Figure C-11
Biochemical and Chemical Oxygen Demands

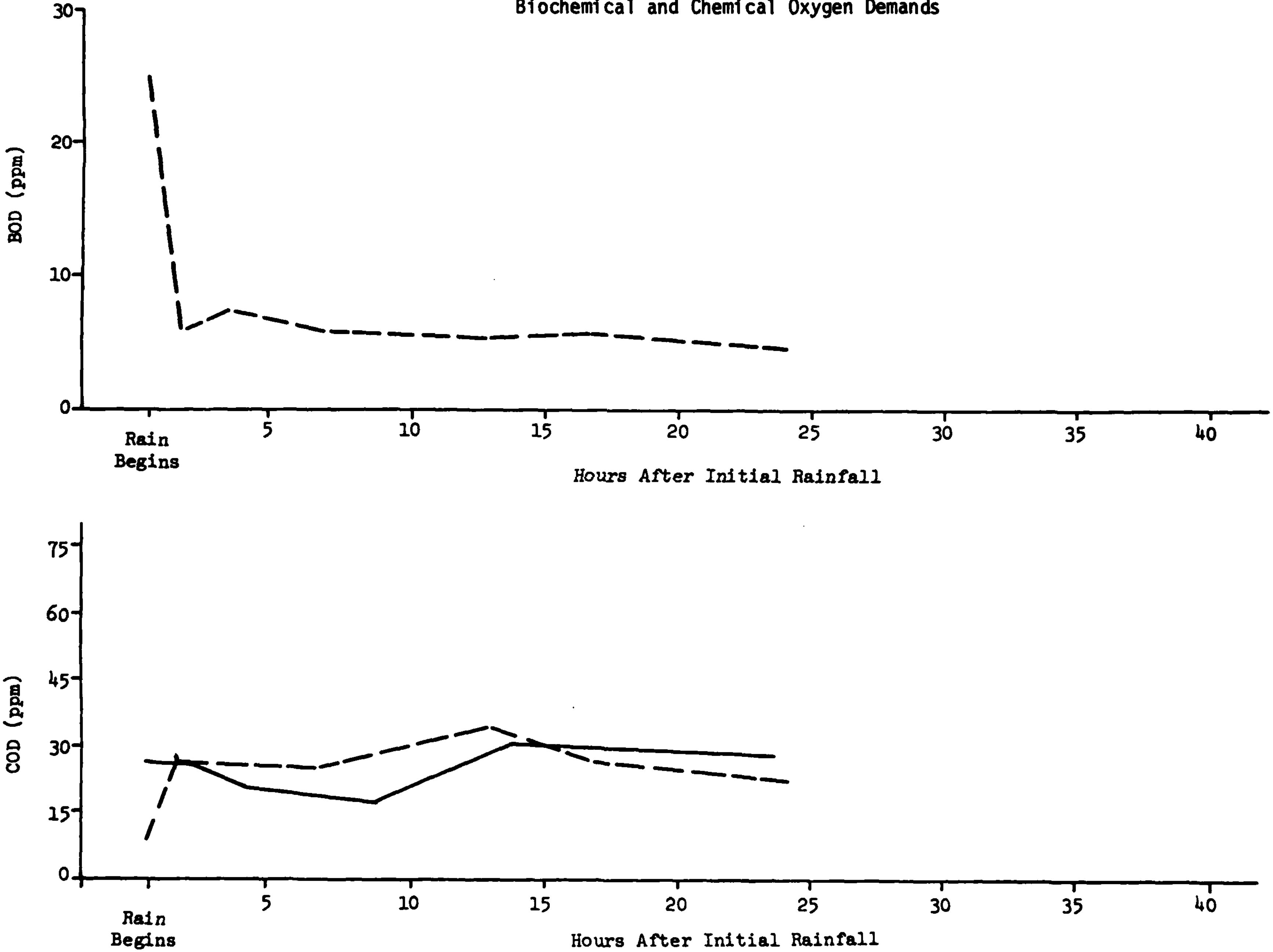


Figure C-12
Fecal Bacteria

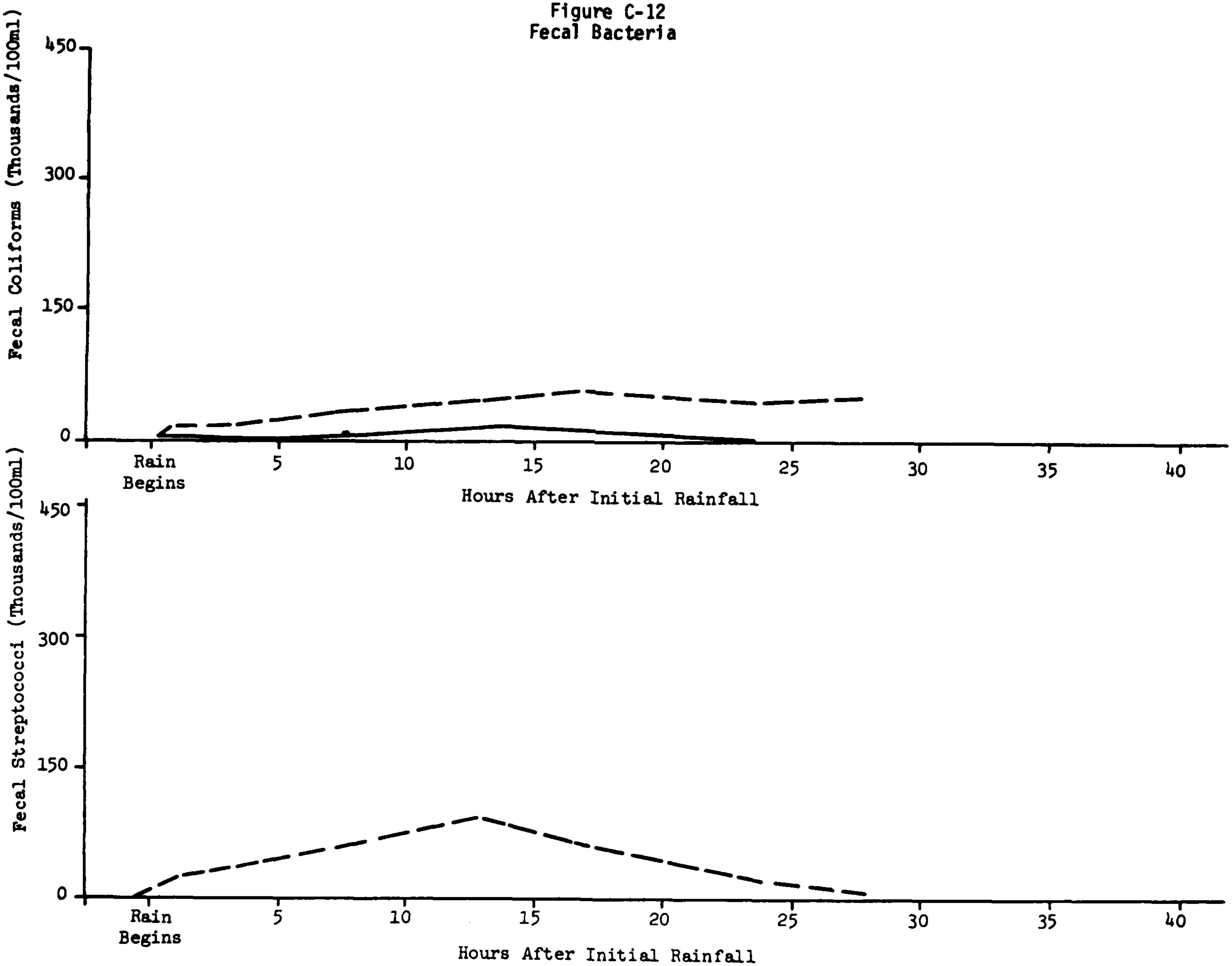


Figure C-13
Ammonia and Kjeldahl Nitrogen

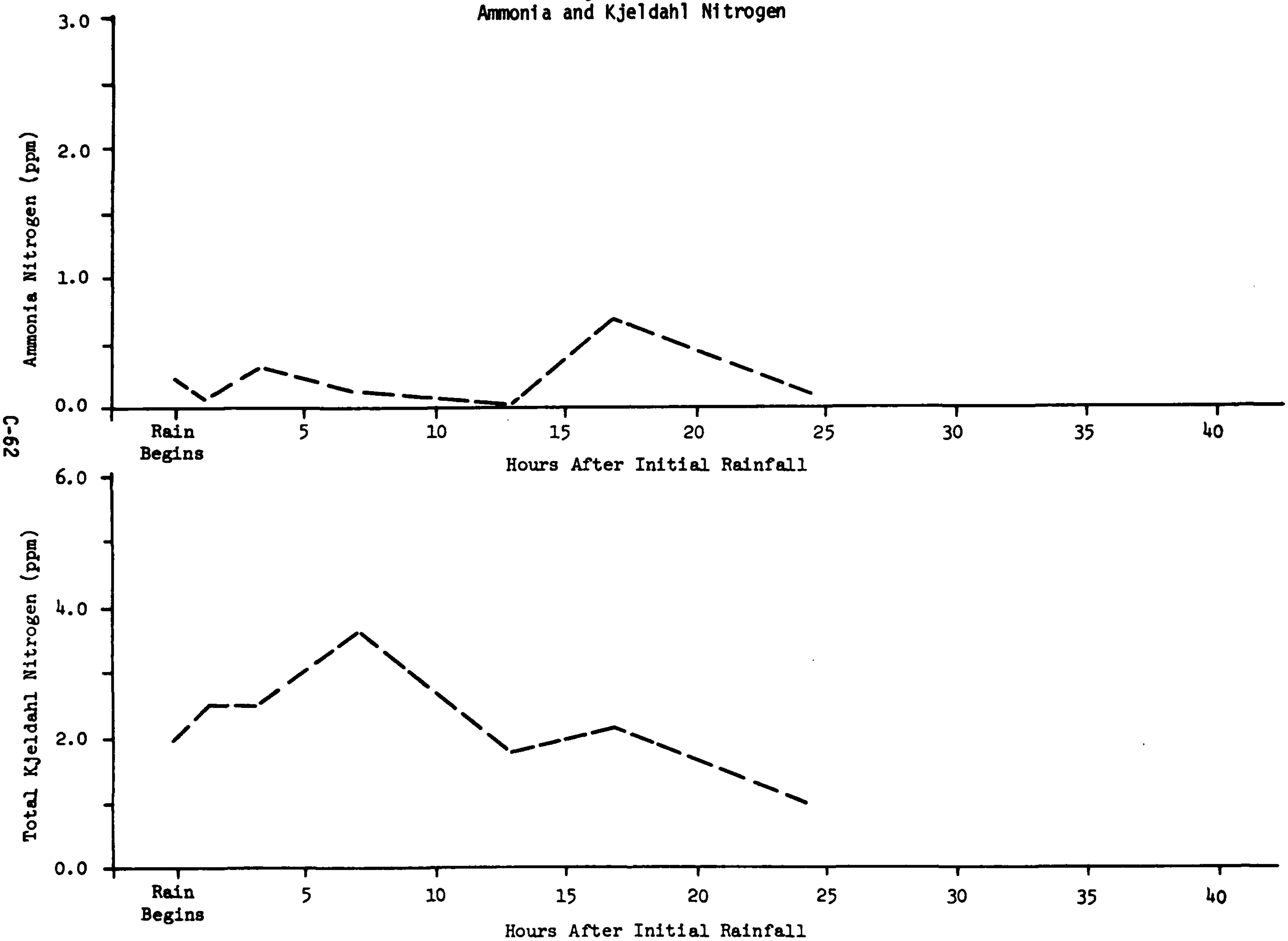


Figure C-14
Suspended Solids and Total Phosphorus

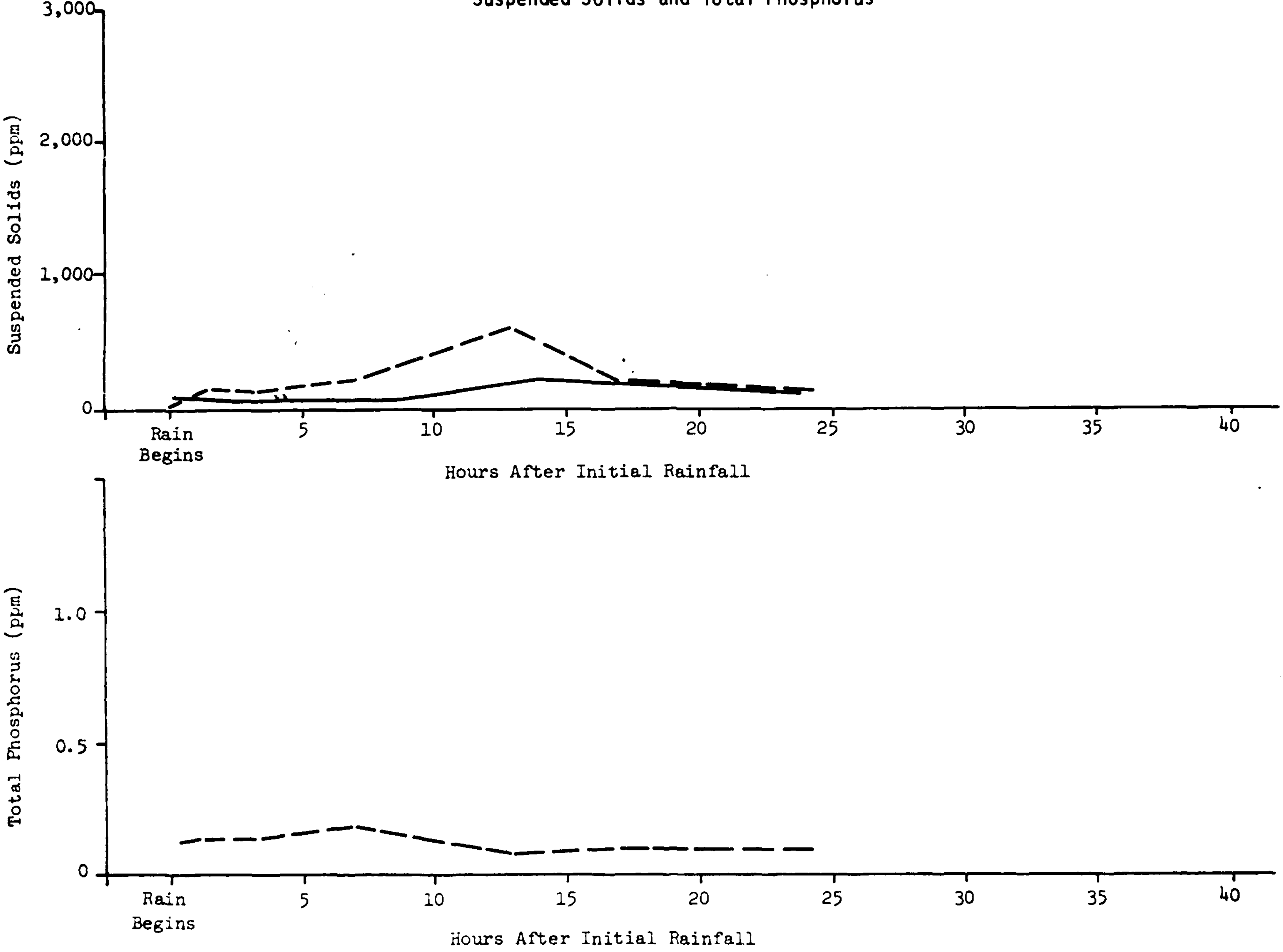
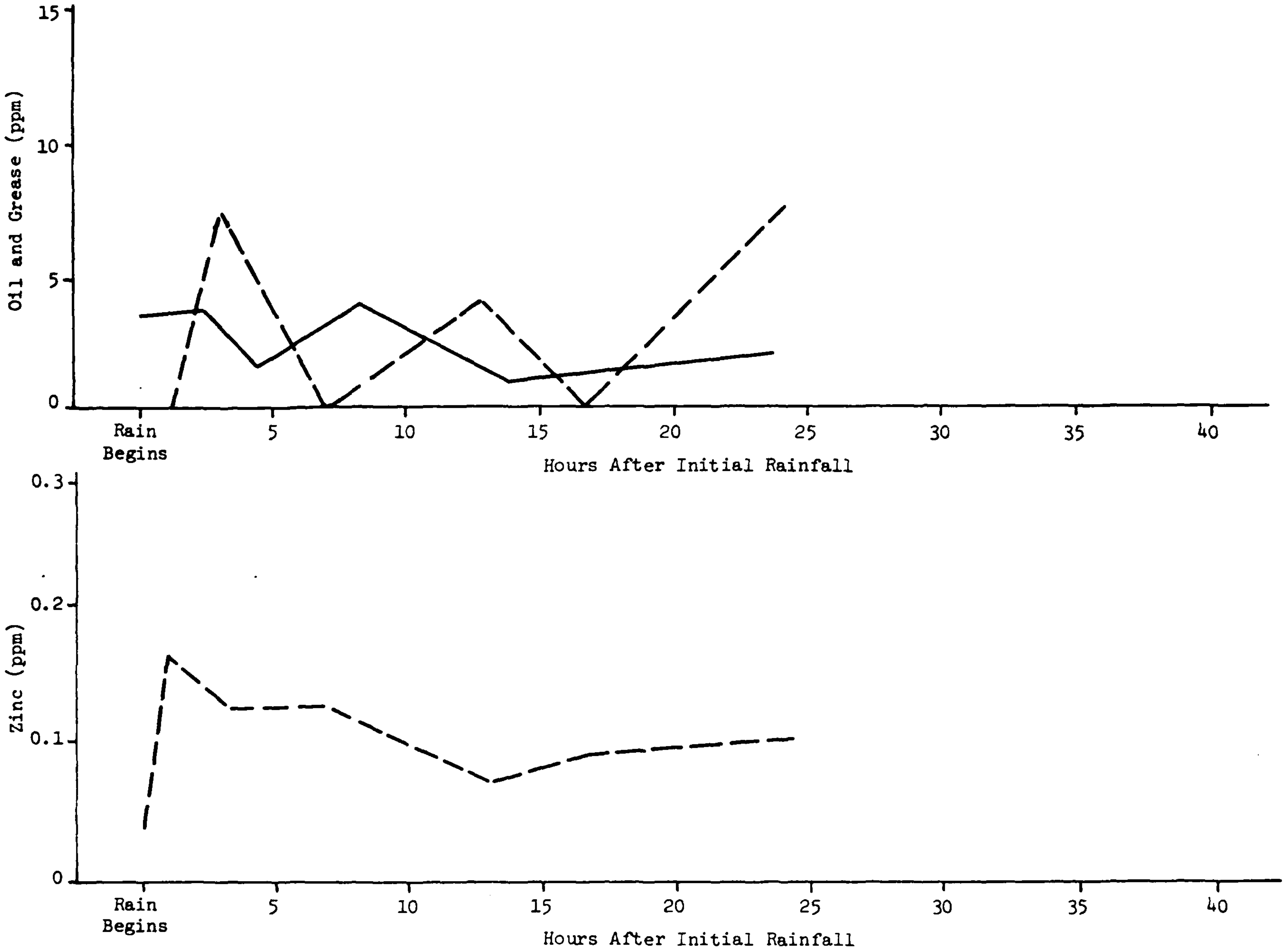


Figure C-15
Oil, Grease and Zinc



STORMWATER QUALITY

STATION 4

STORM EVENTS:

May 14 - 15, 1974

July 25 - 26, 1974

December 6 - 7, 1974

February 22 - 23, 1975

Figure C-16
Biochemical and Chemical Oxygen Demands

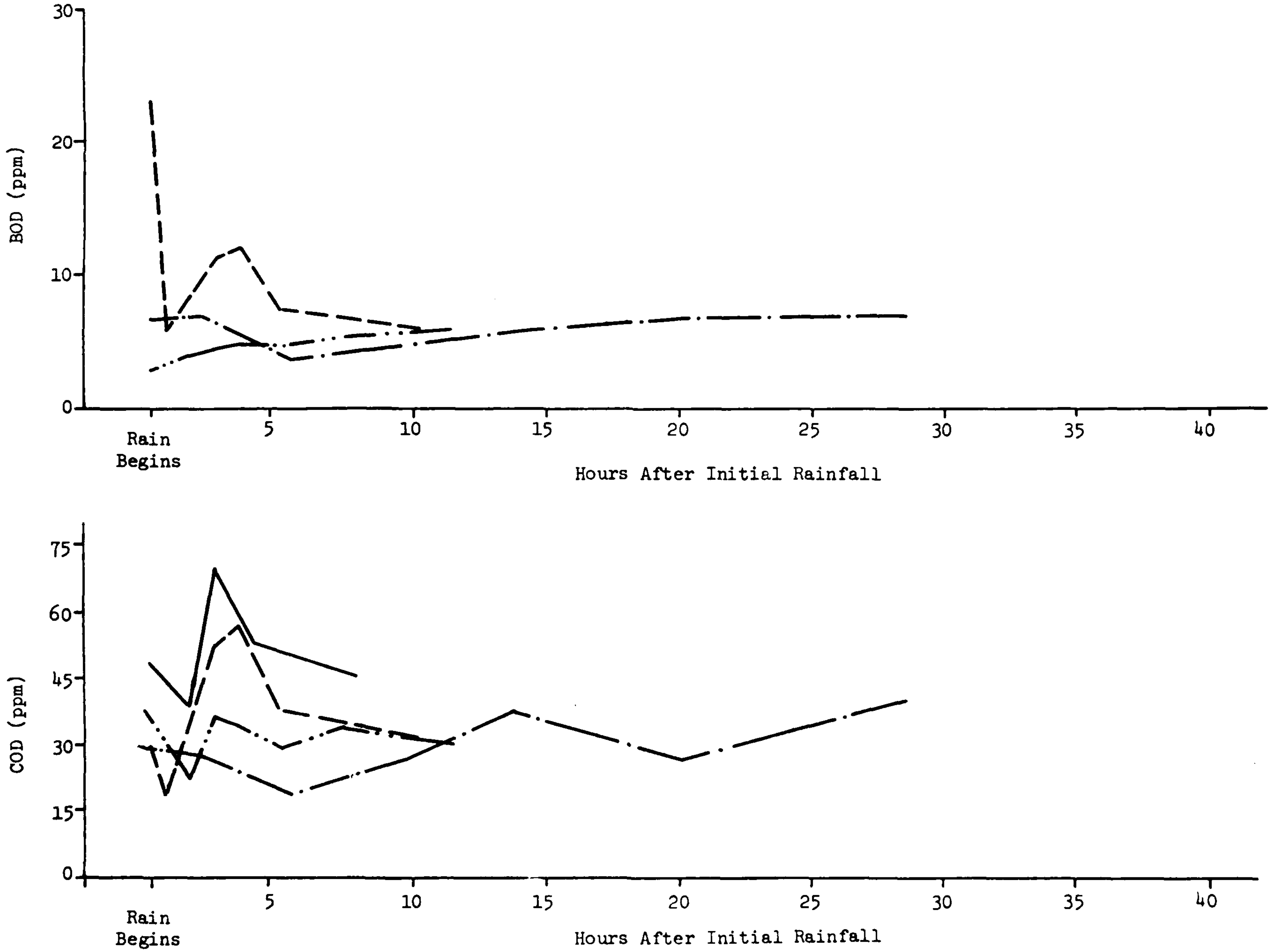


Figure C-17
Fecal Bacteria

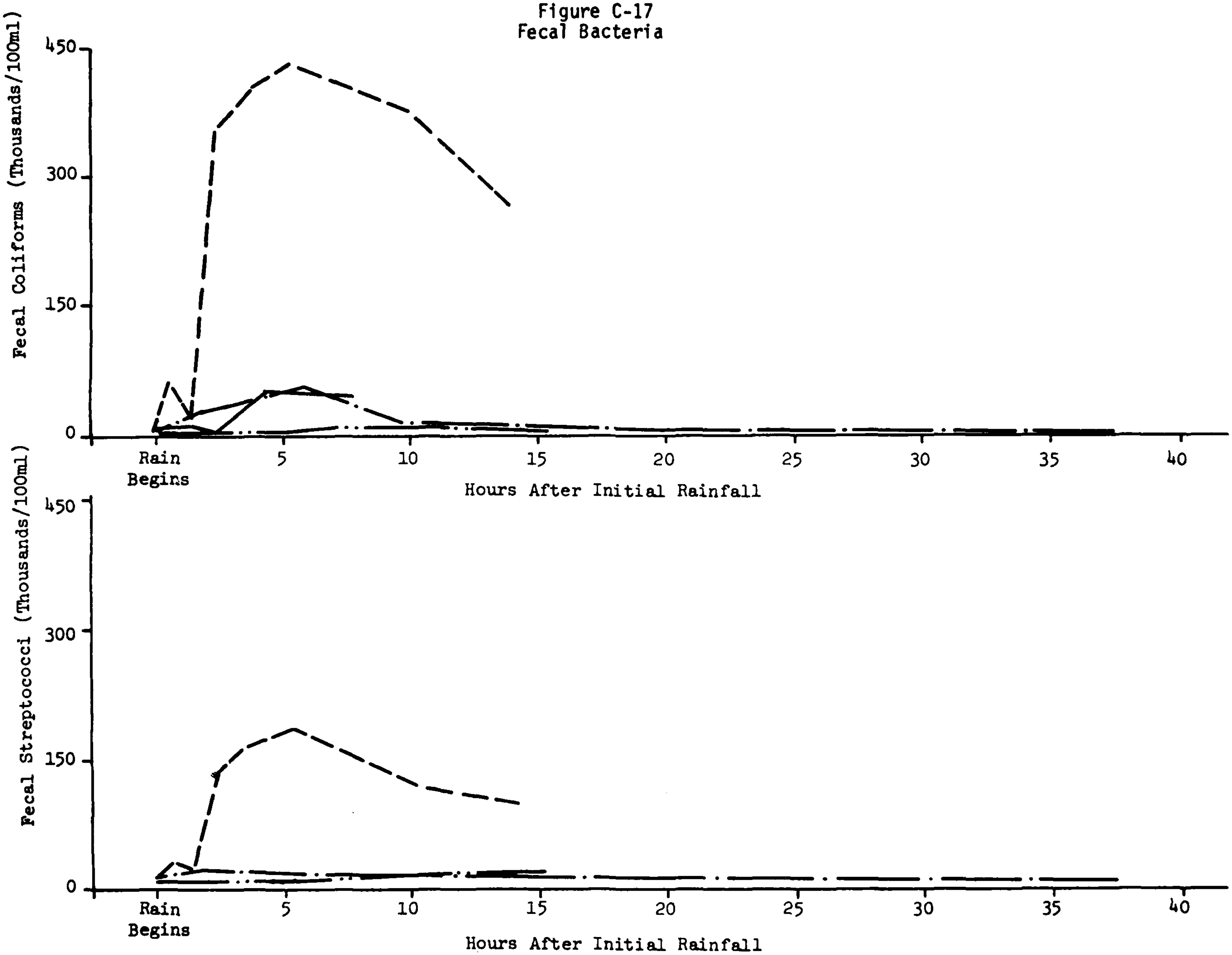


Figure C-18
Ammonia and Kjeldahl Nitrogen

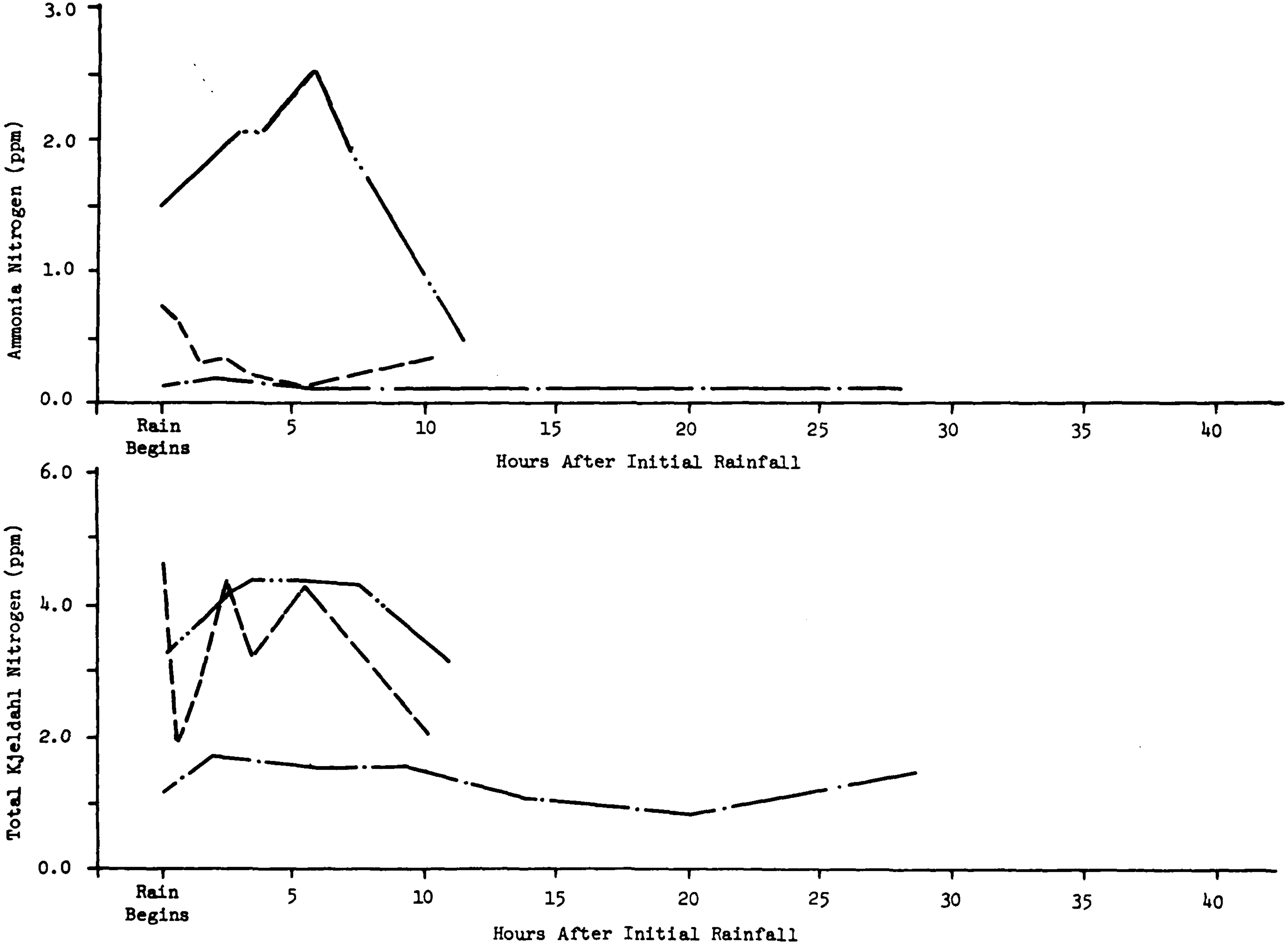


Figure C-19
Suspended Solids and Total Phosphorus

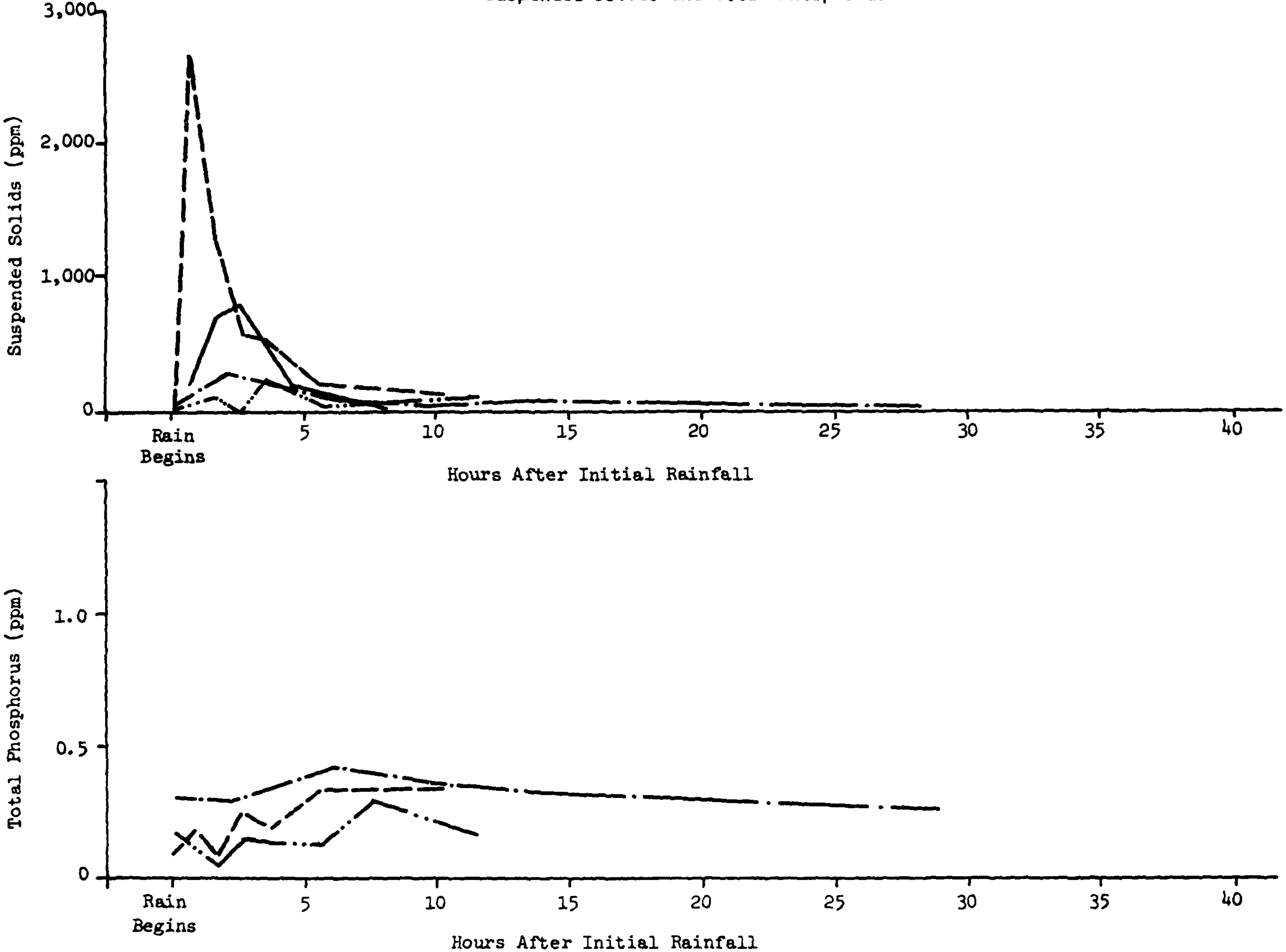
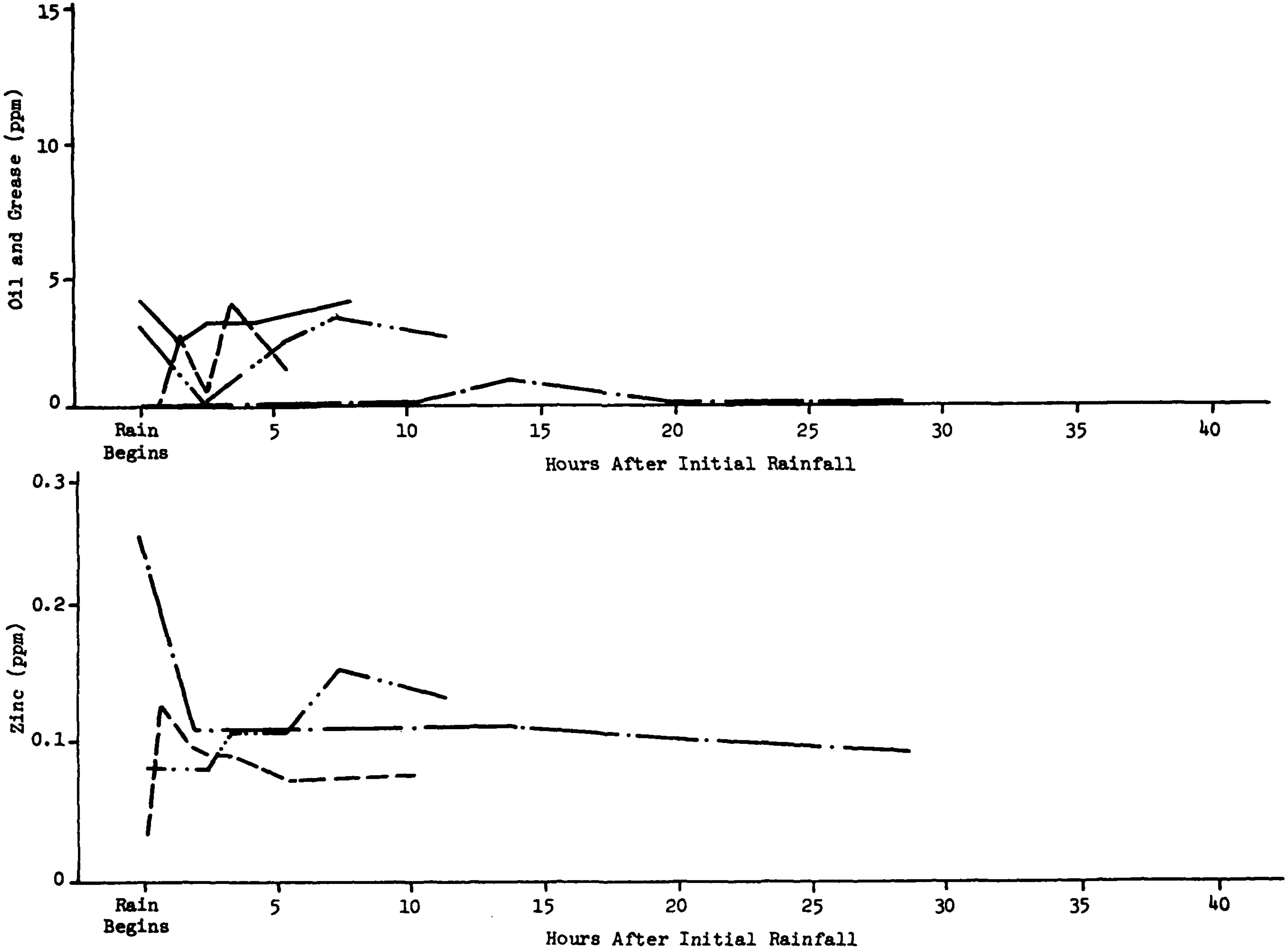


Figure C-20
Oil, Grease and Zinc



STORMWATER QUALITY

STATION 5

STORM EVENTS:

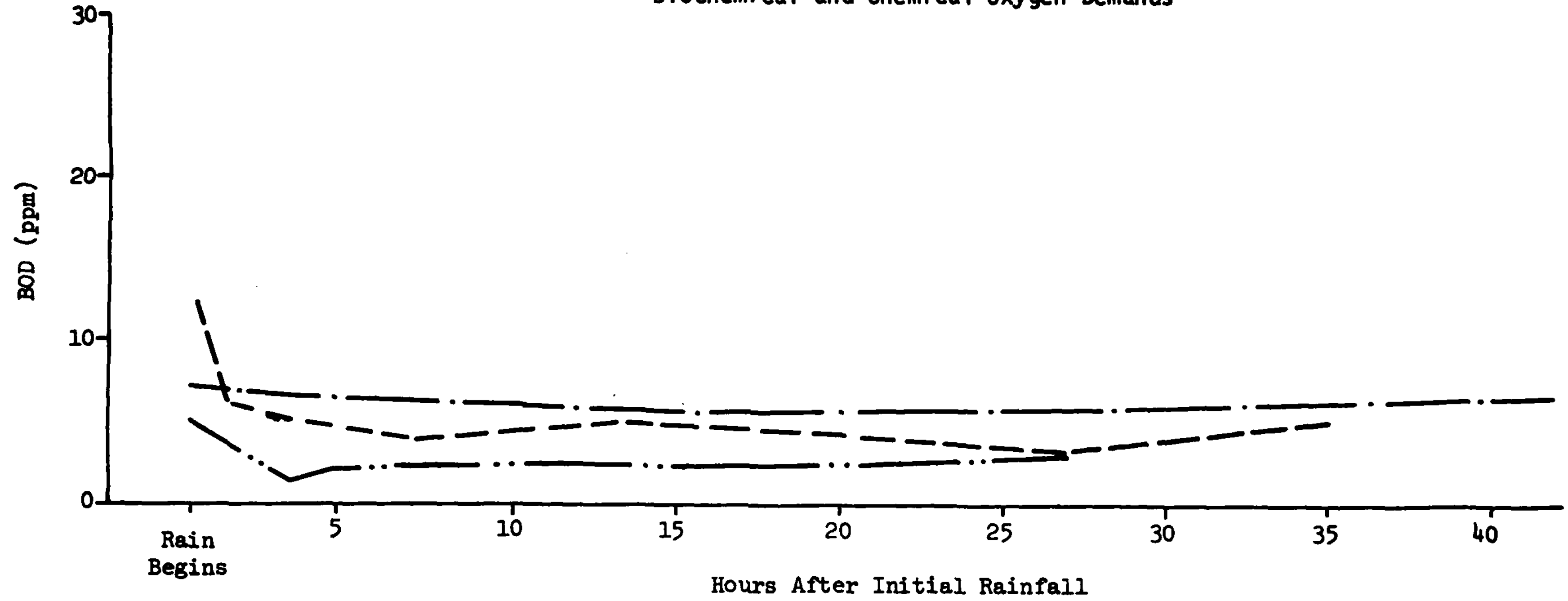
May 14 - 15, 1974

July 25 - 26, 1974

December 6 - 7, 1974

February 22 - 23, 1975

Figure C-21
Biochemical and Chemical Oxygen Demands



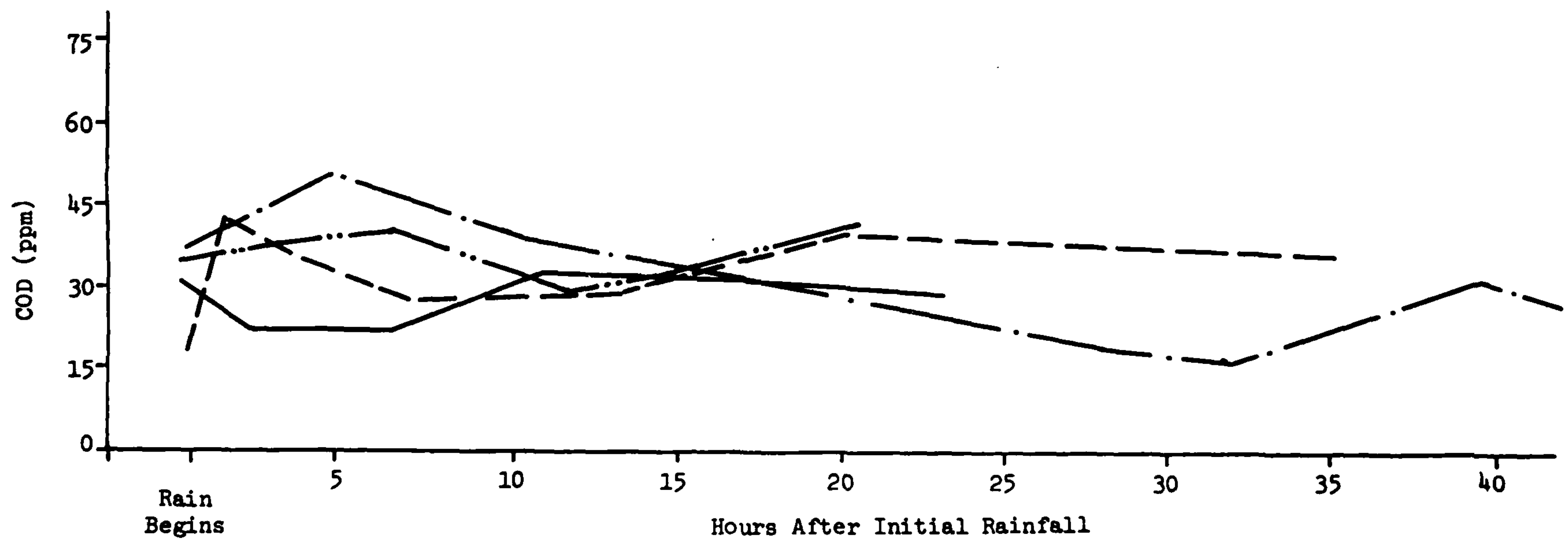


Figure C-22
Fecal Bacteria

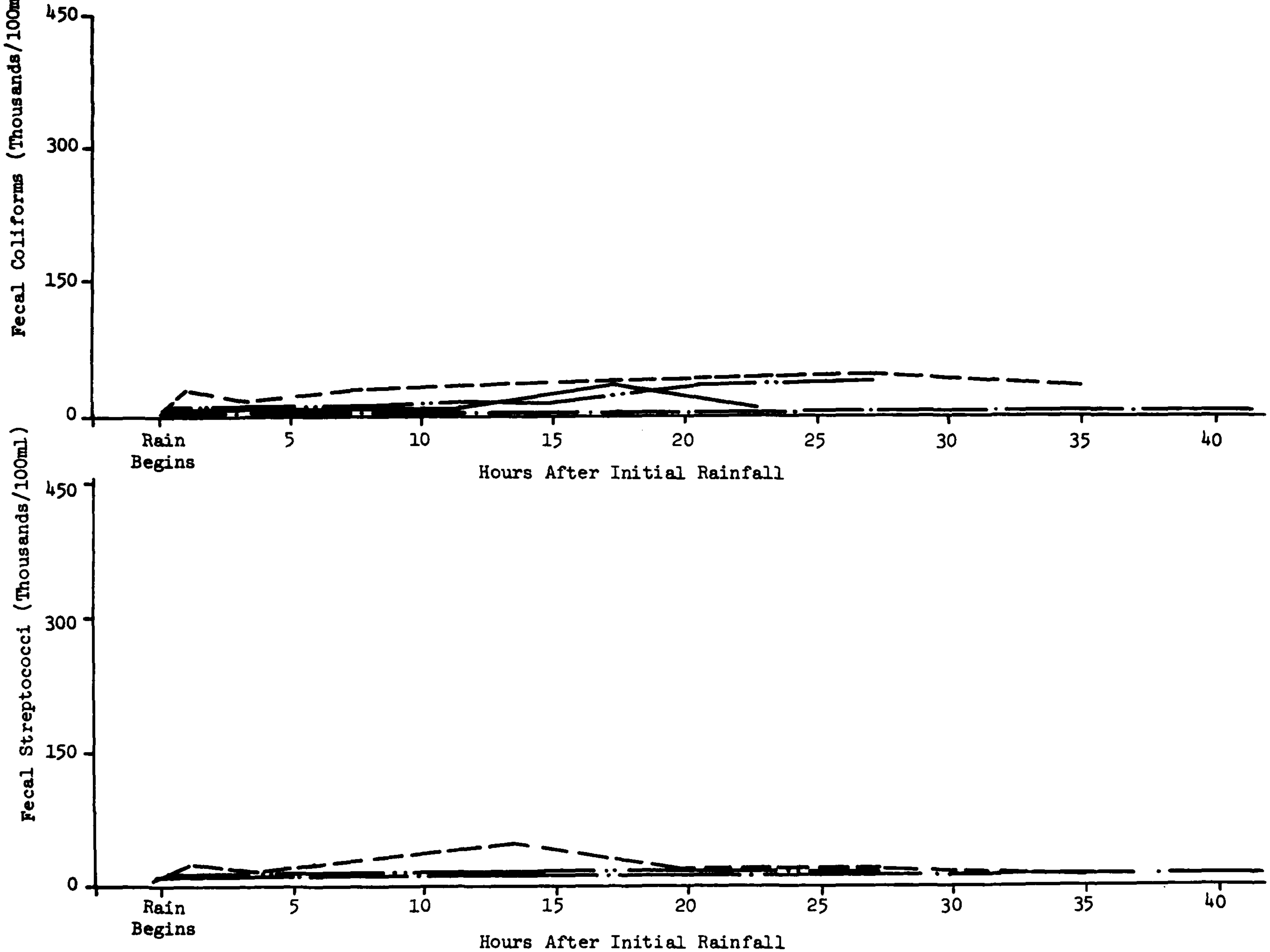


Figure C-23
Ammonia and Kjeldahl Nitrogen

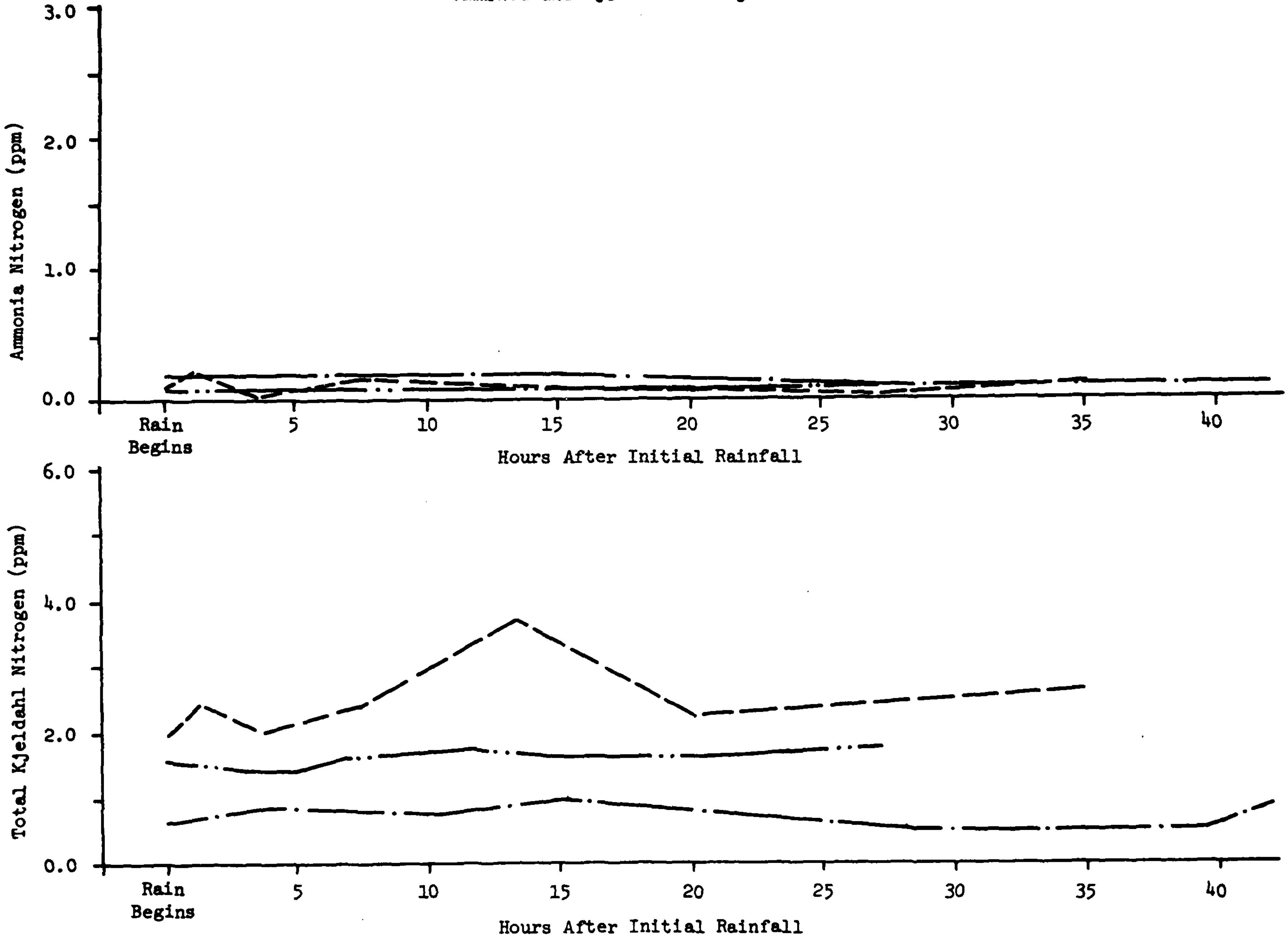


Figure C-24
Suspended Solids and Total Phosphorus

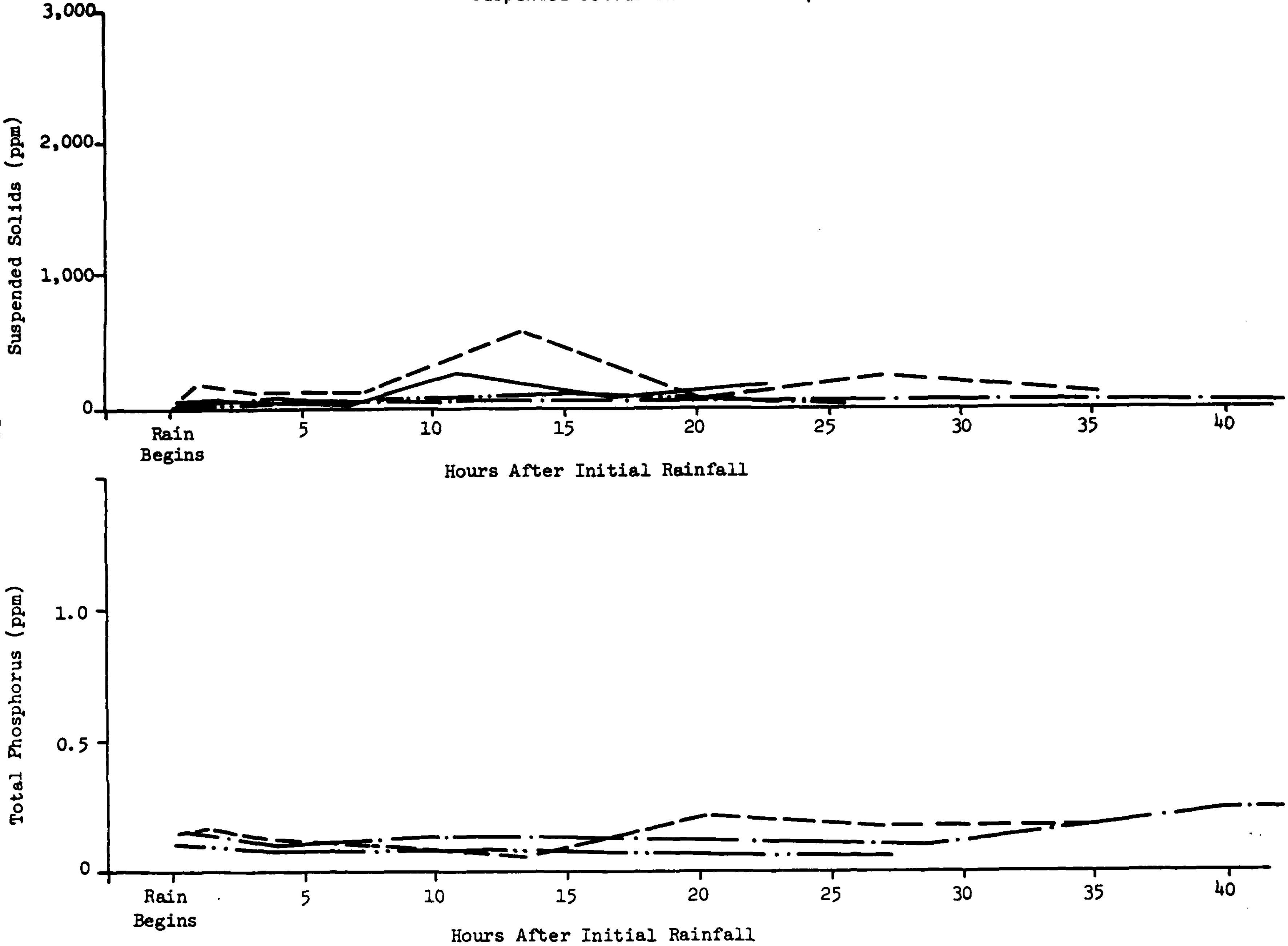
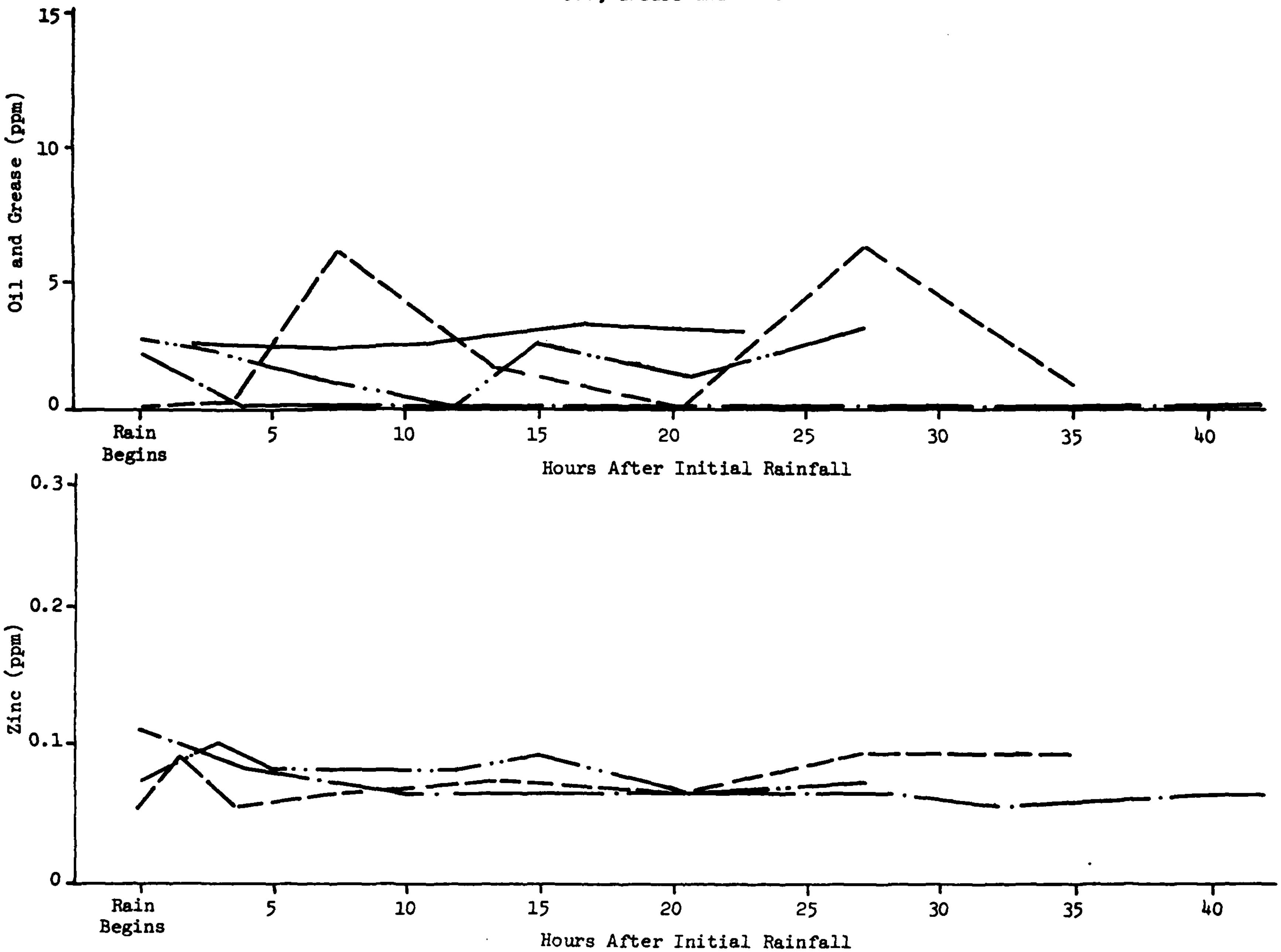


Figure C-25
Oil, Grease and Zinc



STORMWATER QUALITY

STATION 7

STORM EVENTS:

———————	May 14 - 15, 1974
— — — —	July 25 - 26, 1974
—·———·—	January 9 - 11, 1975
—··———··—	March 9 - 10, 1975

Figure C-26
Biochemical and Chemical Oxygen Demands

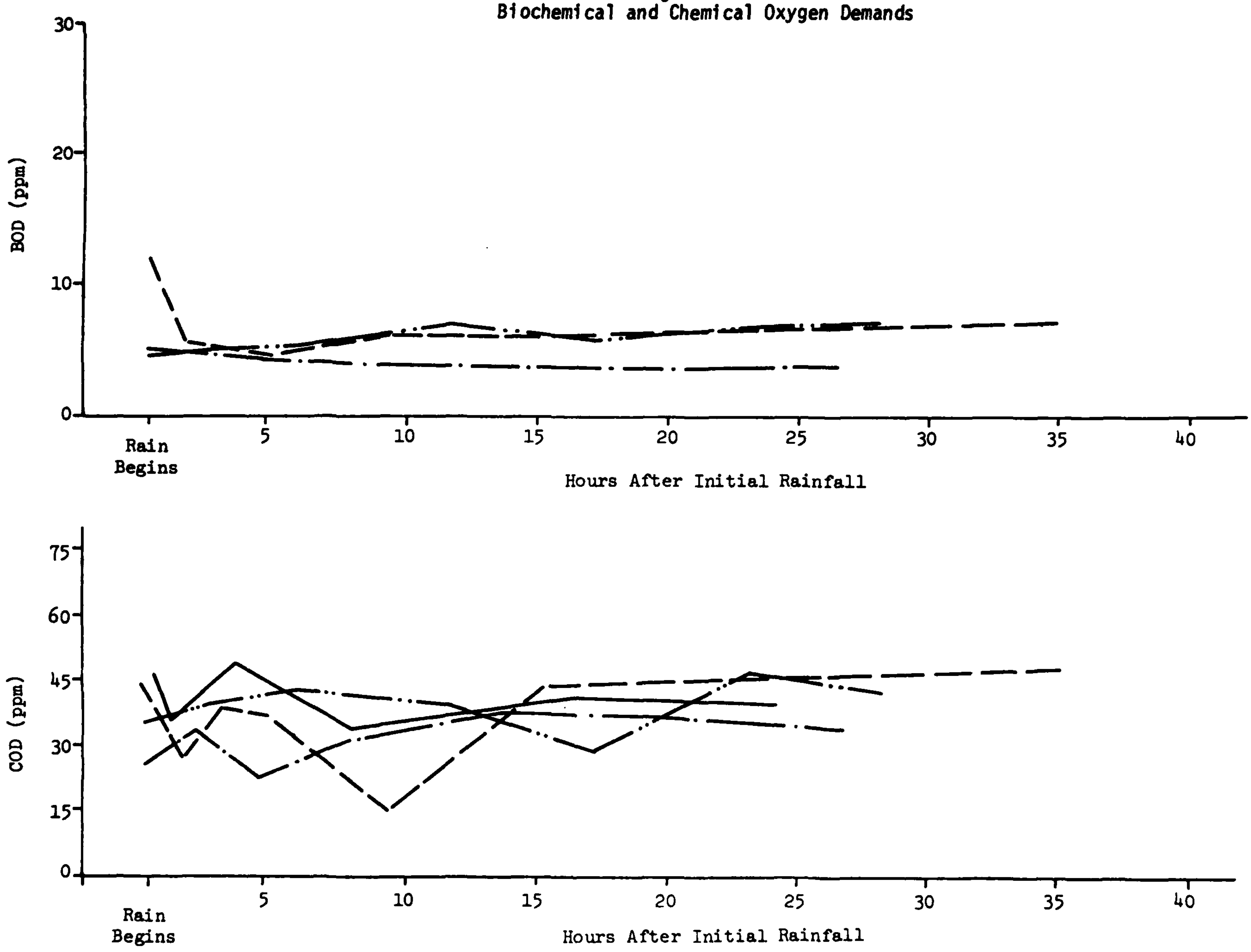


Figure C-27
Fecal Bacteria

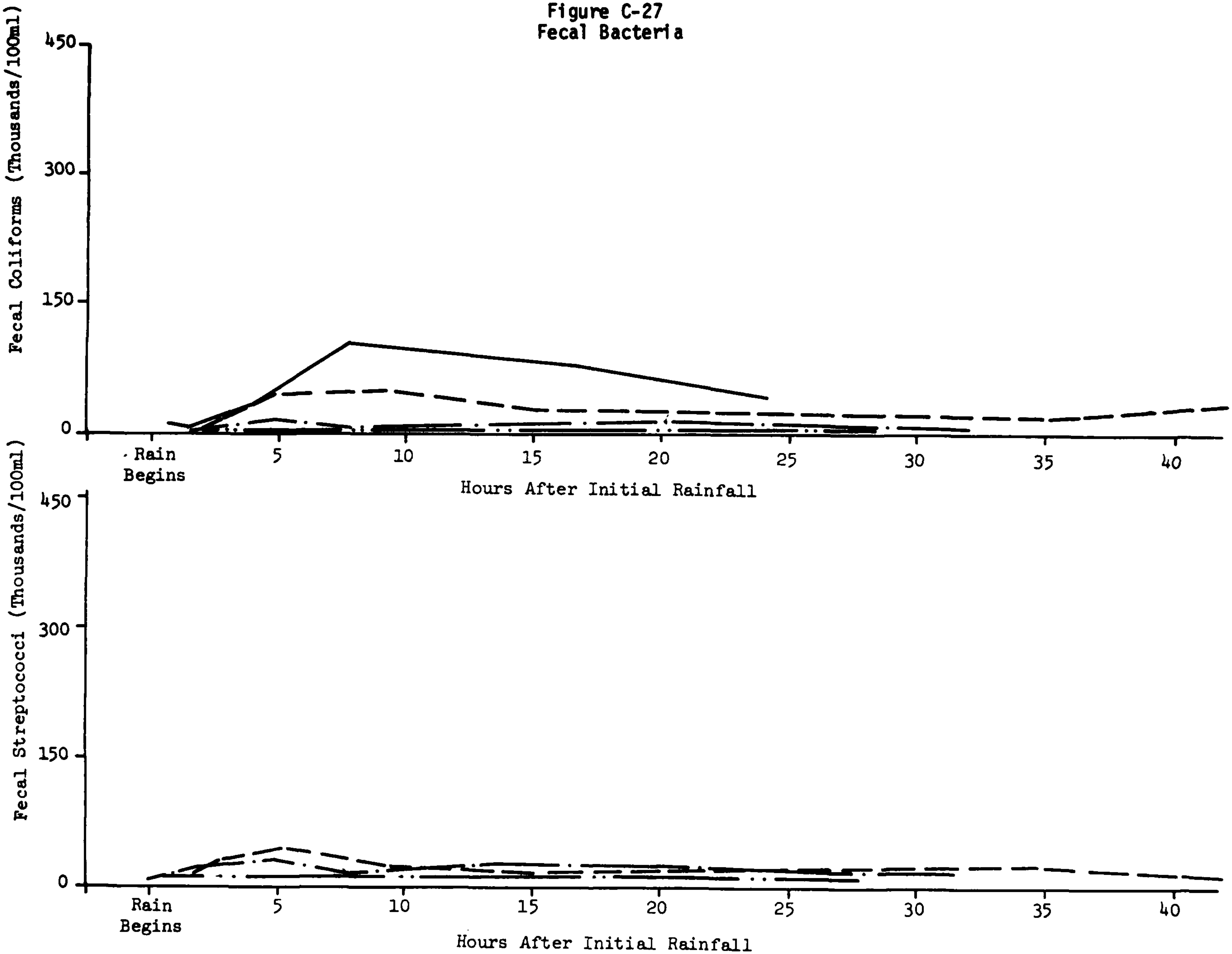


Figure C-28
Ammonia and Kjeldahl Nitrogen

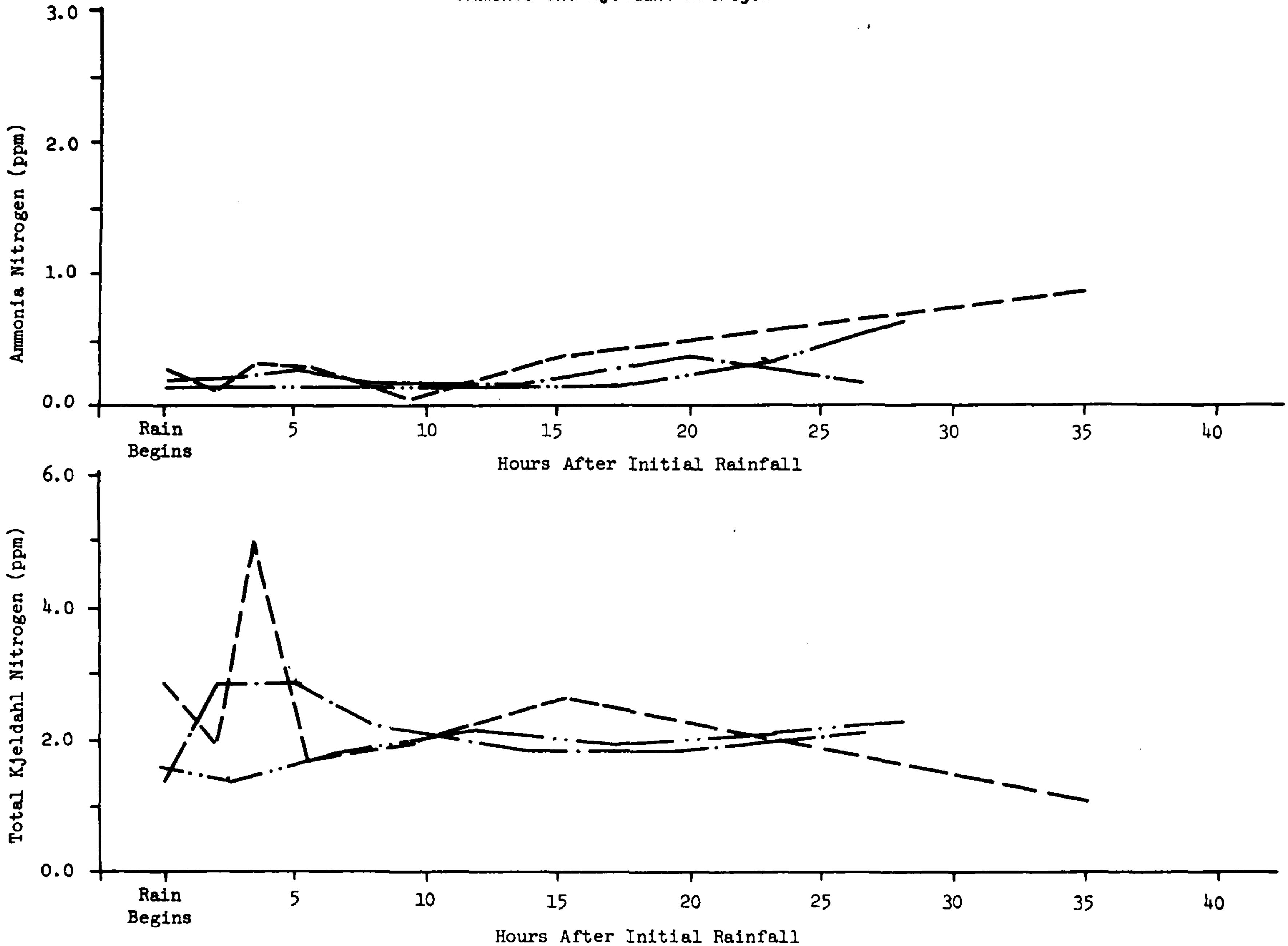


Figure C-29
Suspended Solids and Total Phosphorus

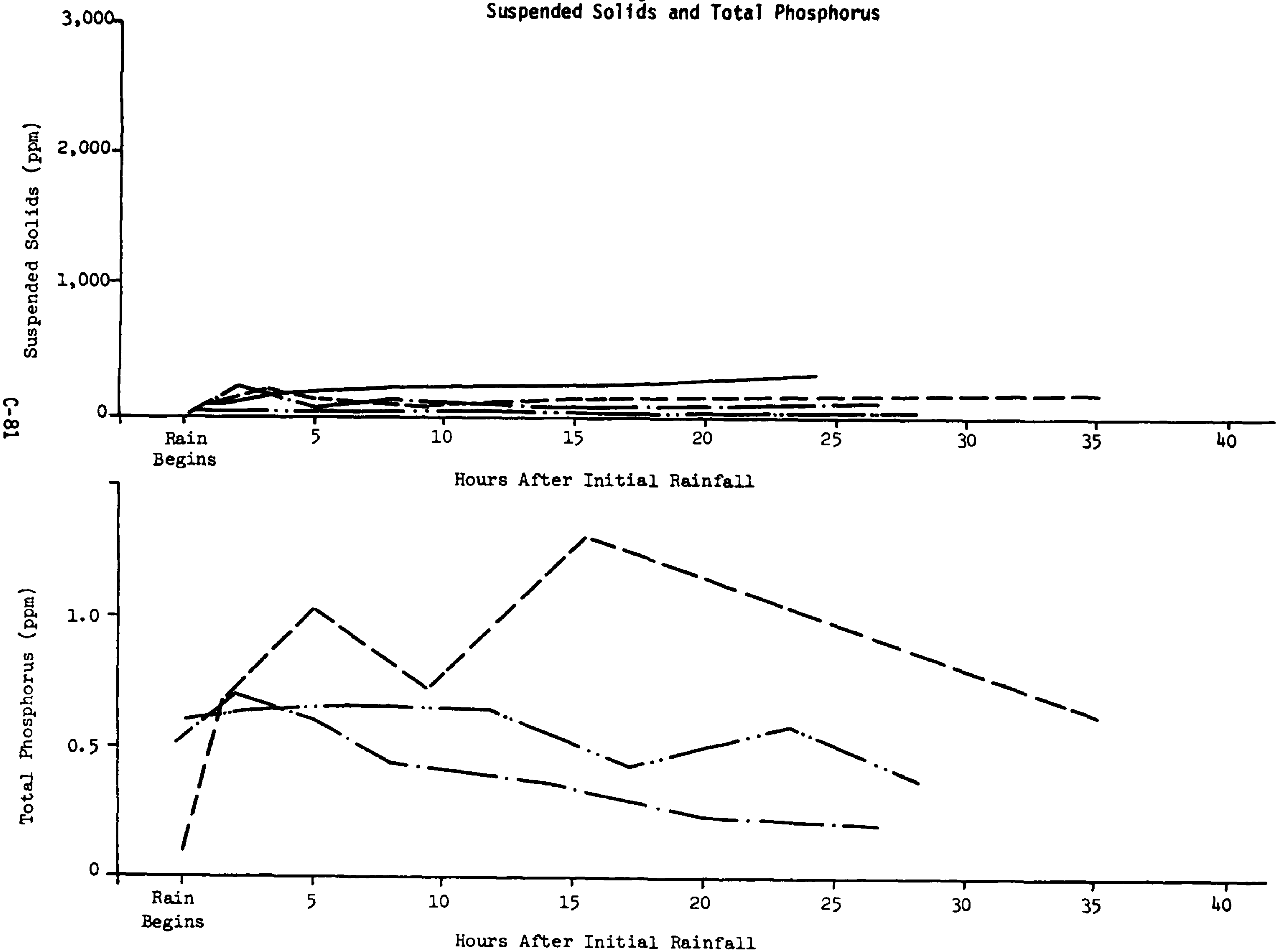
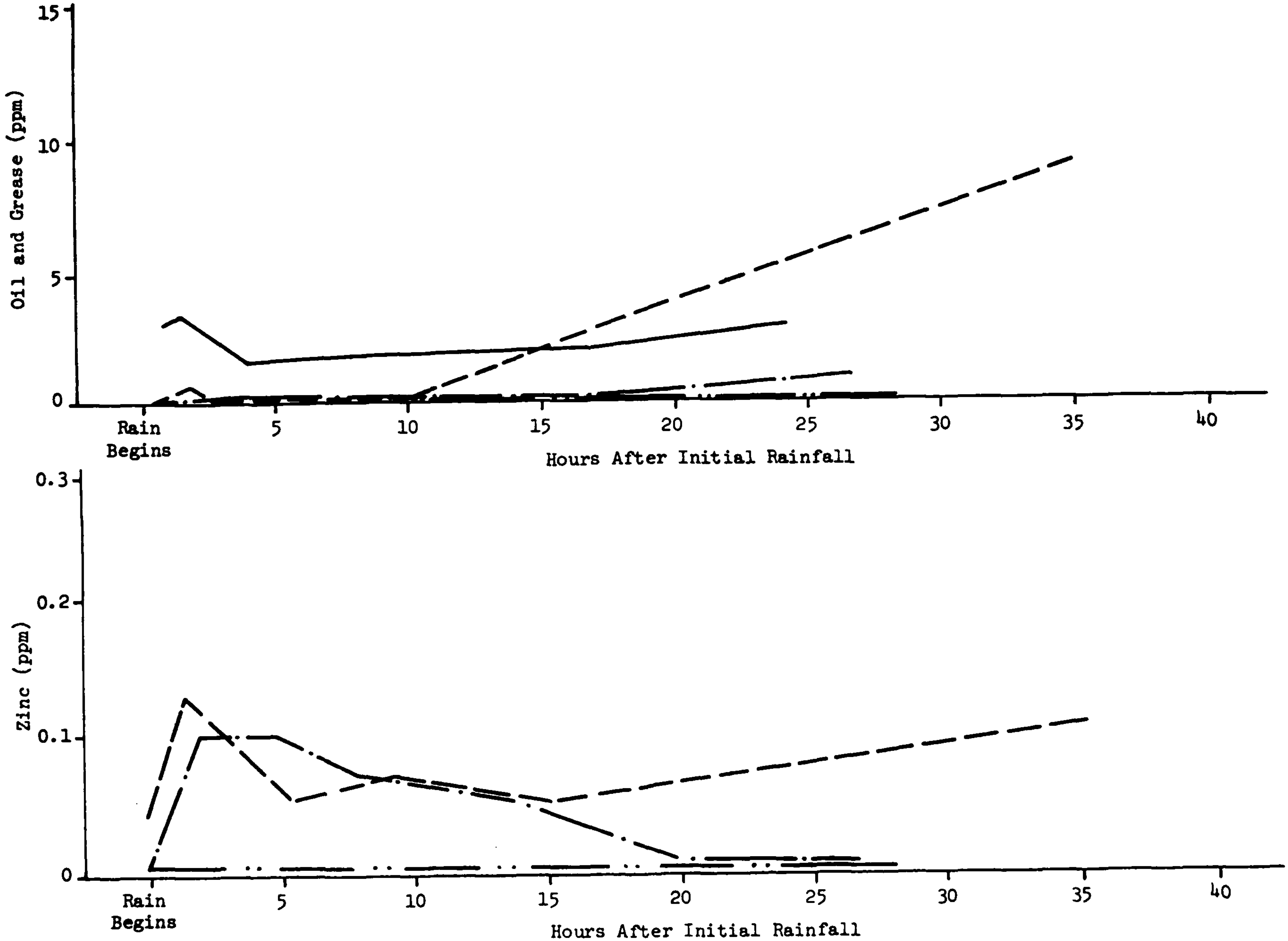


Figure C-30
Oil, Grease and Zinc



STORMWATER QUALITY

STATION 8

STORM EVENTS:

May 14 - 15, 1974

July 25 - 26, 1974

January 9 - 11, 1975

March 9 - 10, 1975

Figure C-31
Biochemical and Chemical Oxygen Demands

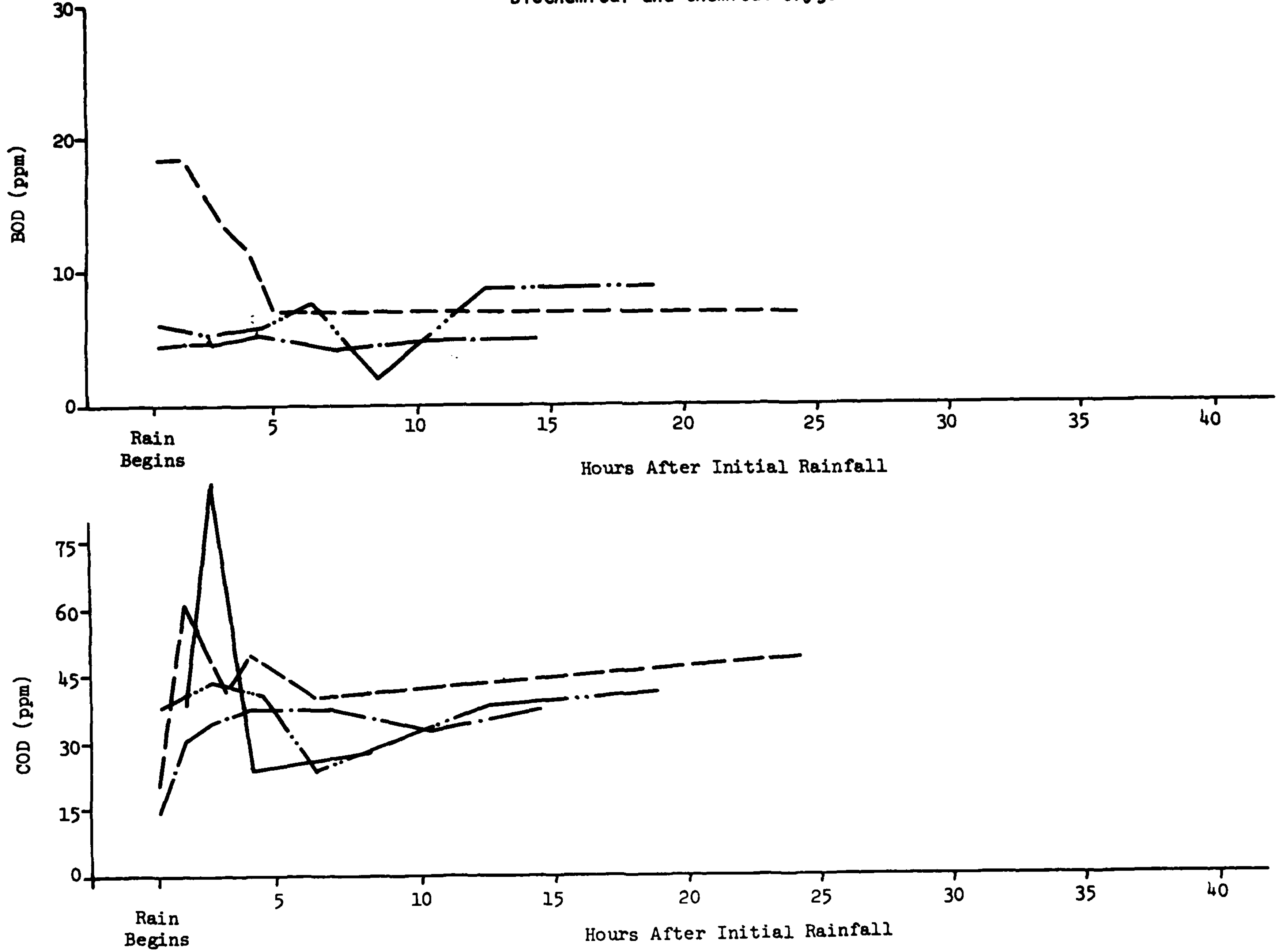


Figure C-32
Fecal Bacteria

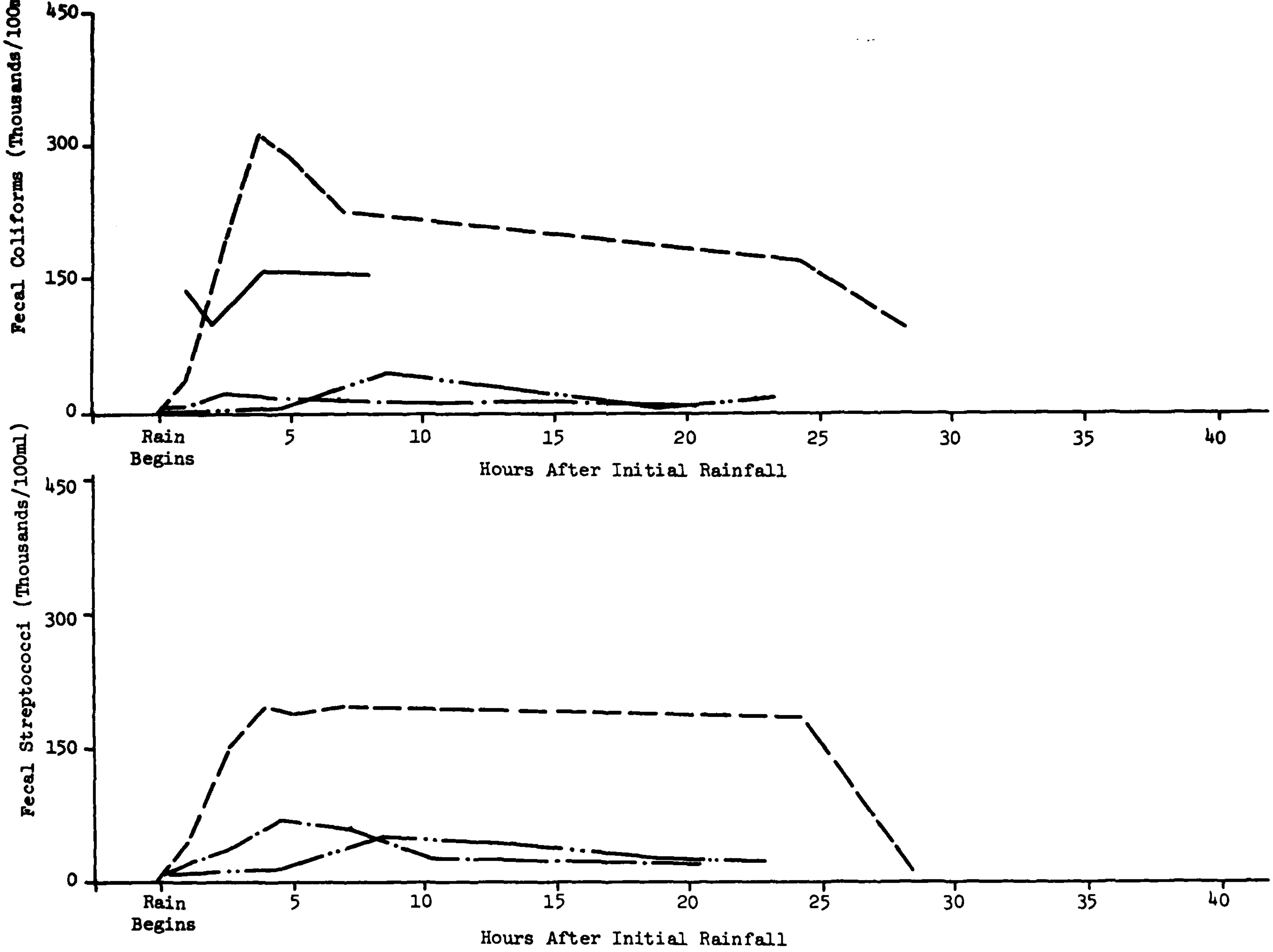


Figure C-33
Ammonia and Kjeldahl Nitrogen

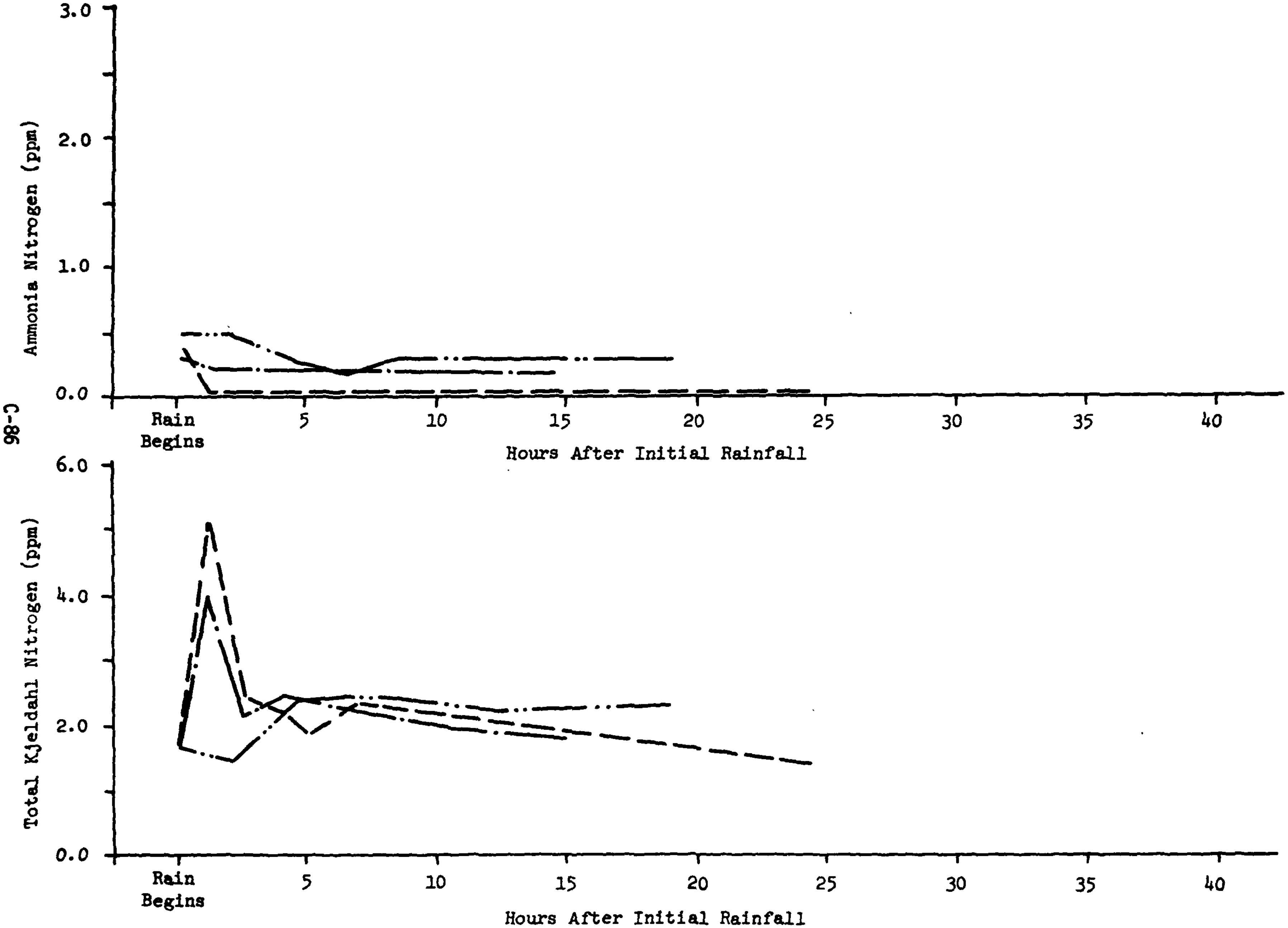


Figure C-34
Suspended Solids and Total Phosphorus

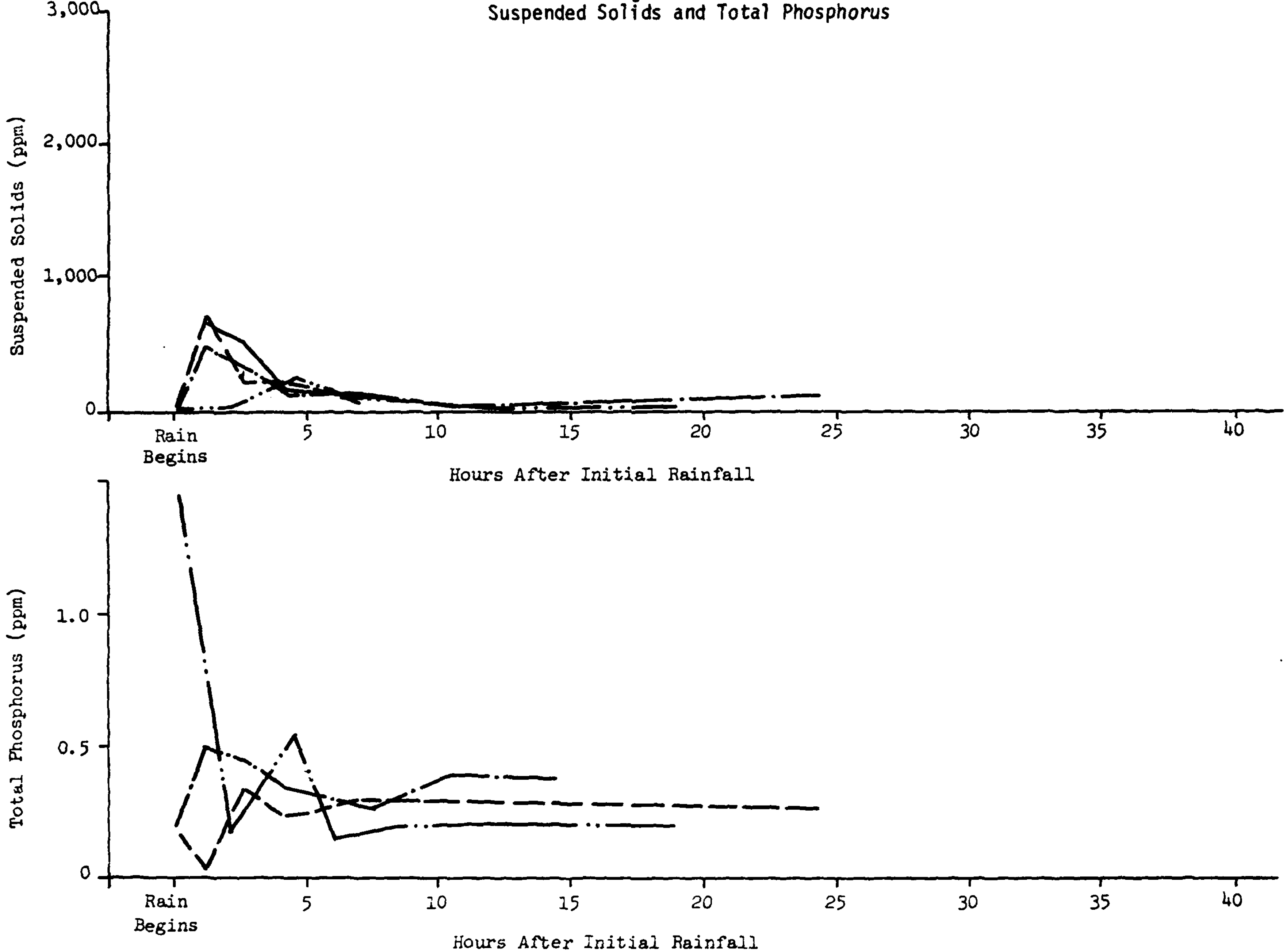
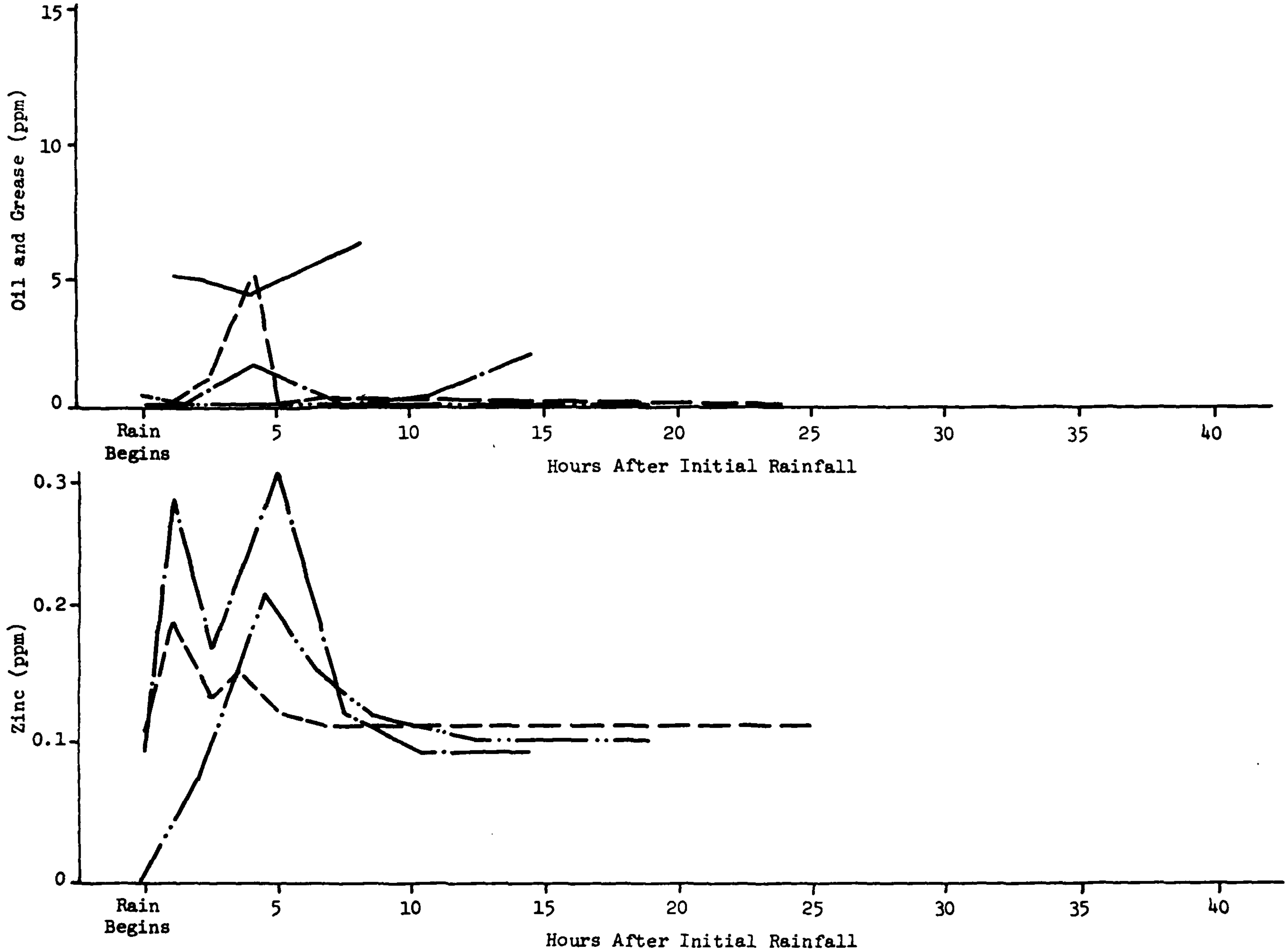


Figure C-35
Oil, Grease and Zinc



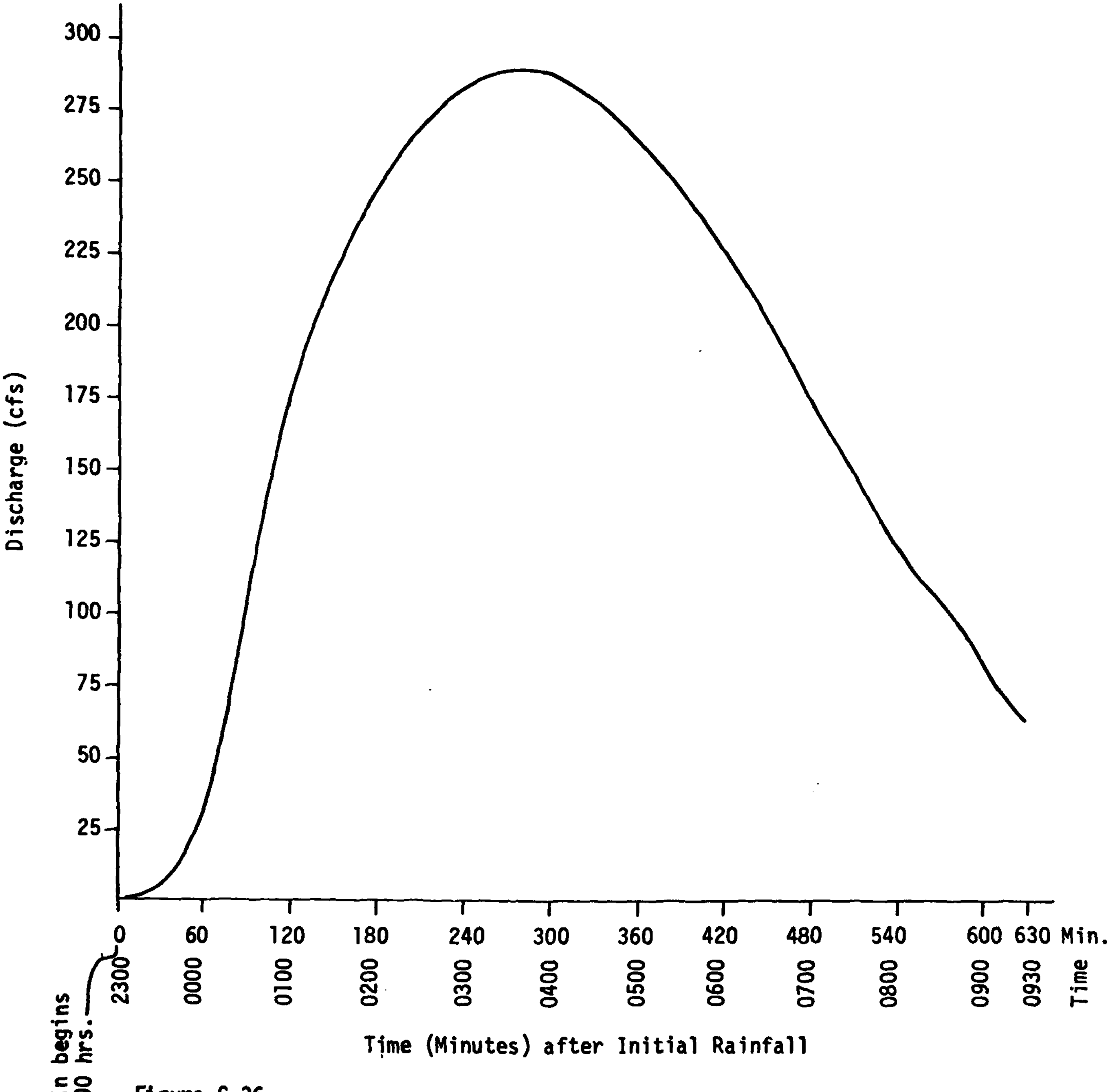


Figure C-36
Discharge Curve at Station 4, July 25-26, 1974 Storm

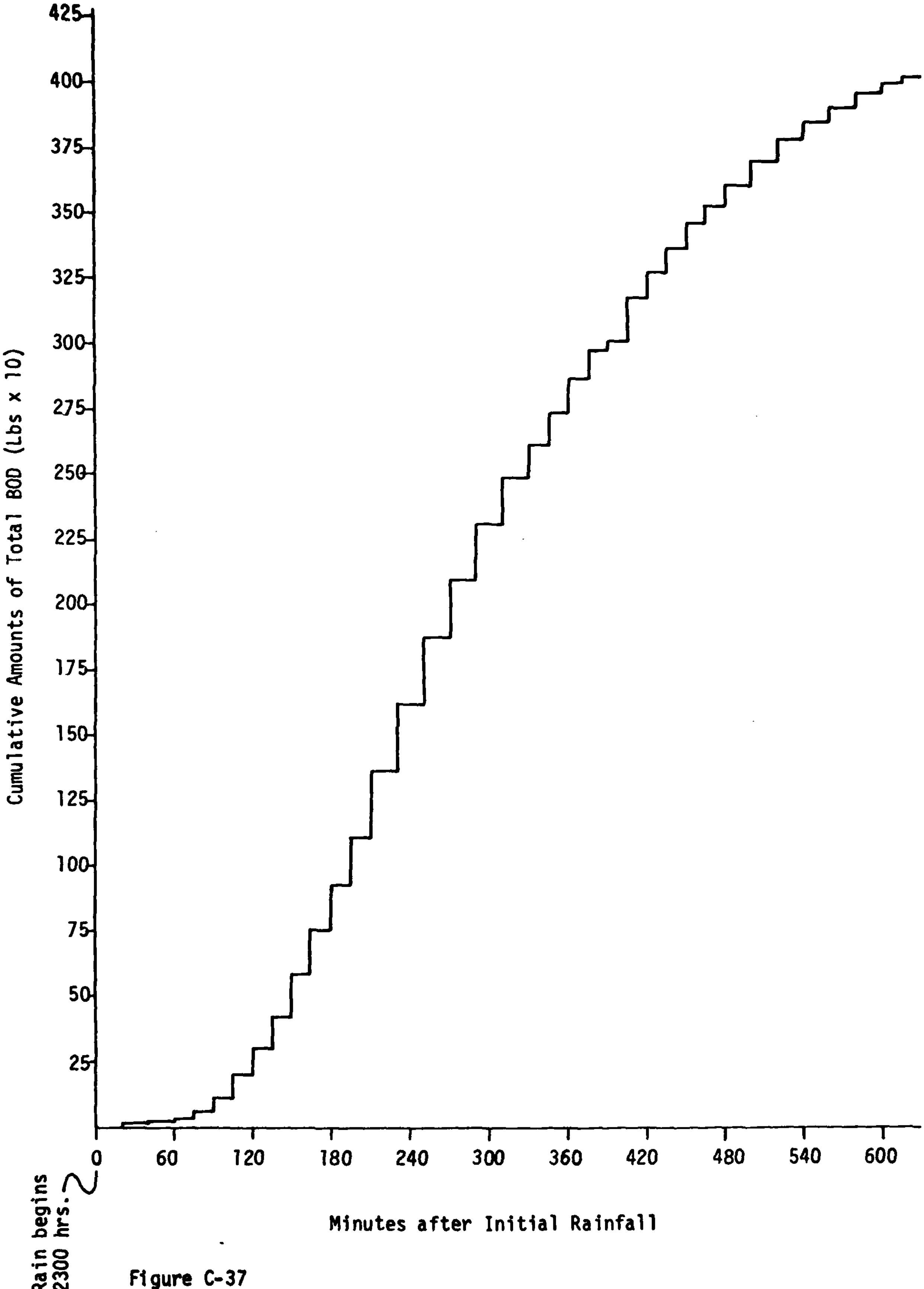


Figure C-37
BOD Loading at Station 4, July 25-26, 1974 Storm

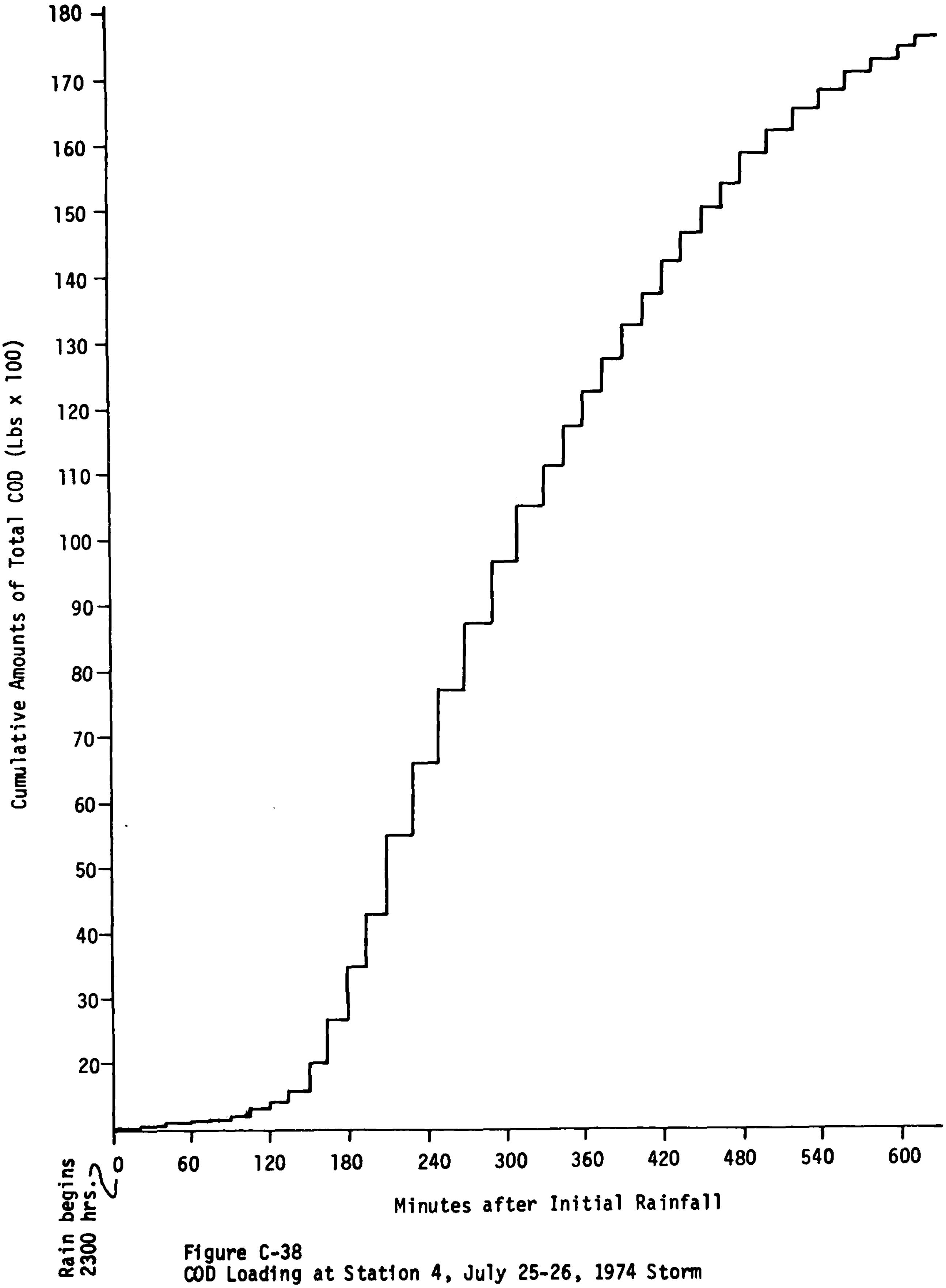


Figure C-38
COD Loading at Station 4, July 25-26, 1974 Storm

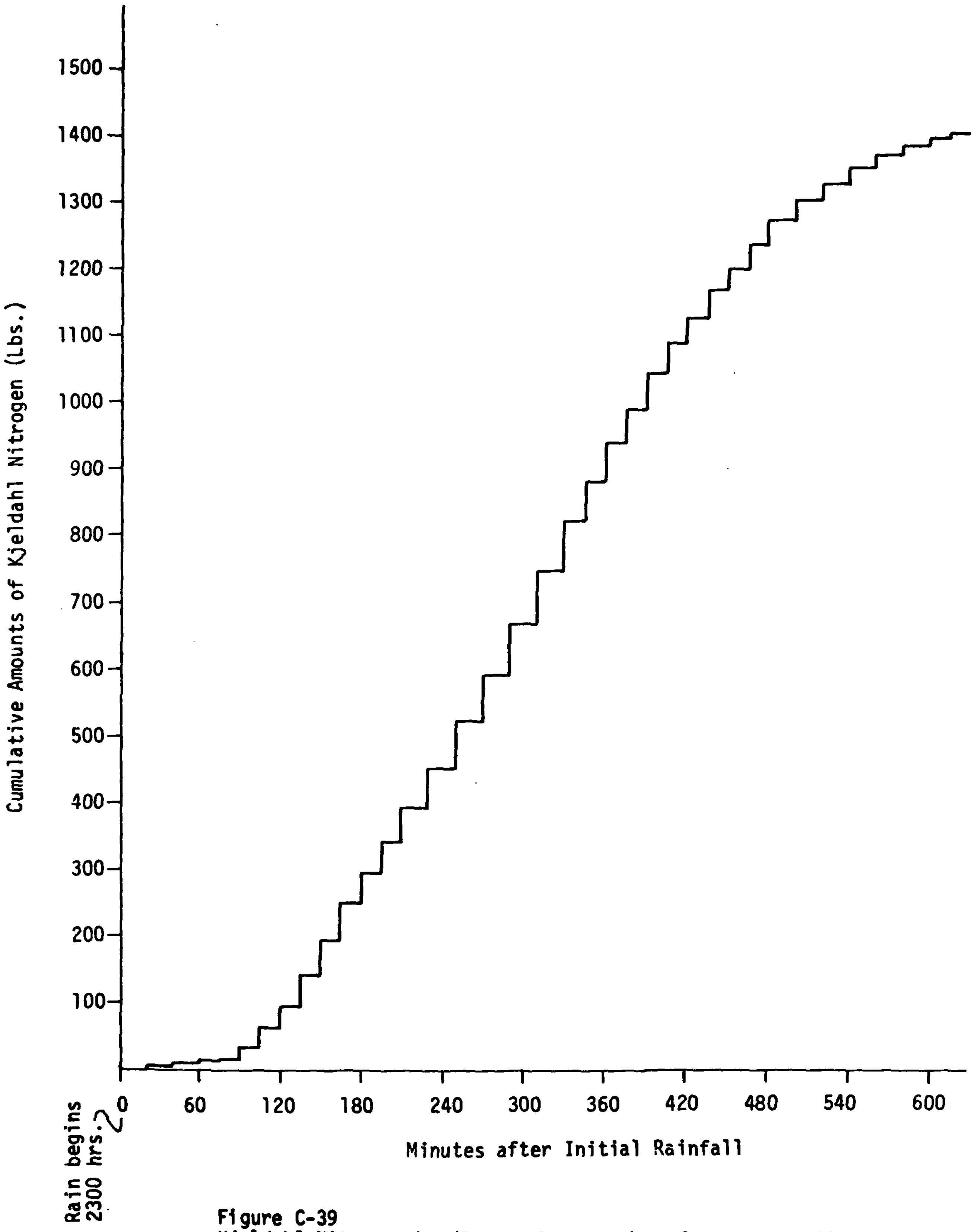


Figure C-39
Kjeldahl Nitrogen Loading at Station 4, July 25-26, 1974 Storm

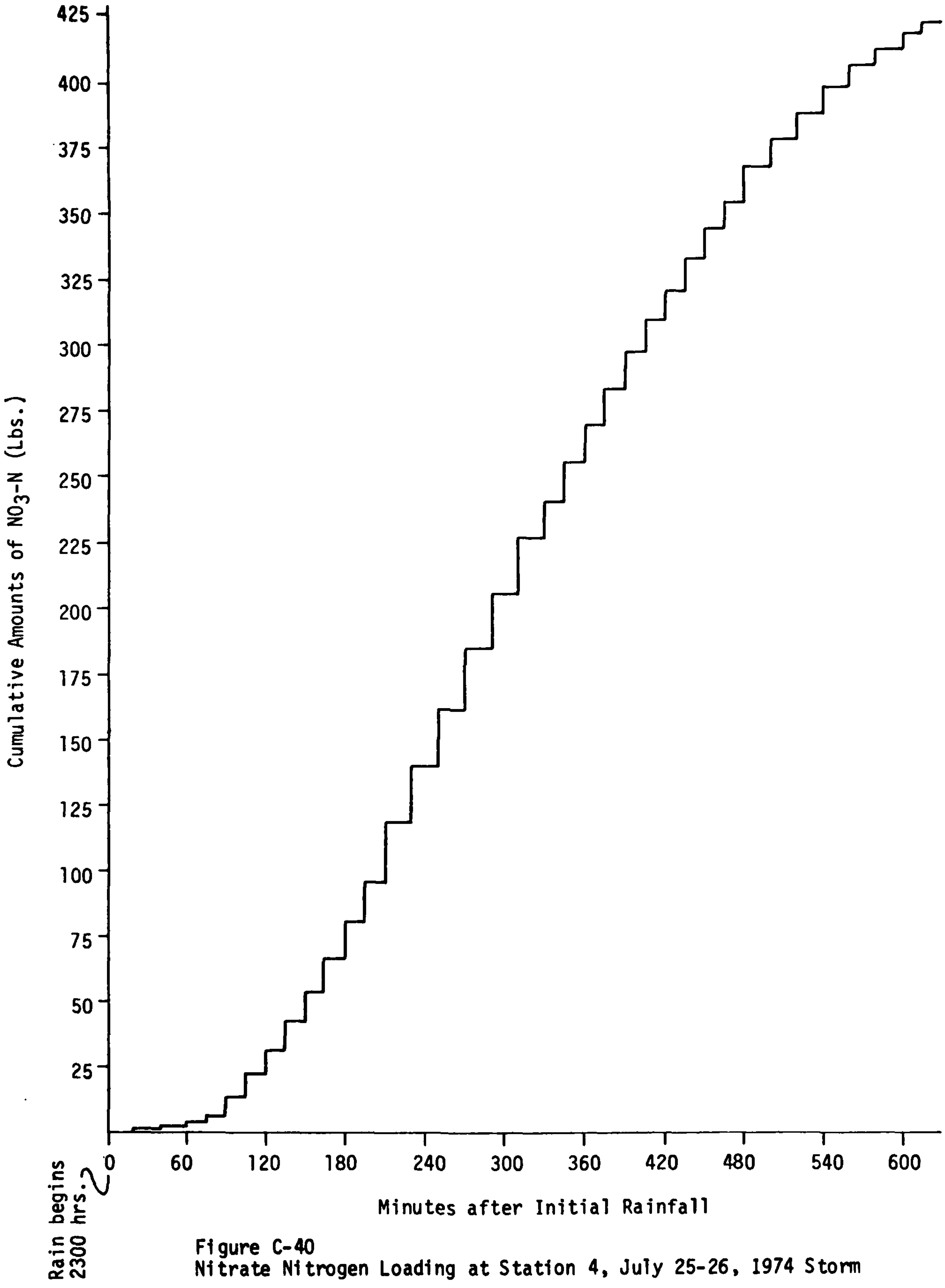


Figure C-40
Nitrate Nitrogen Loading at Station 4, July 25-26, 1974 Storm

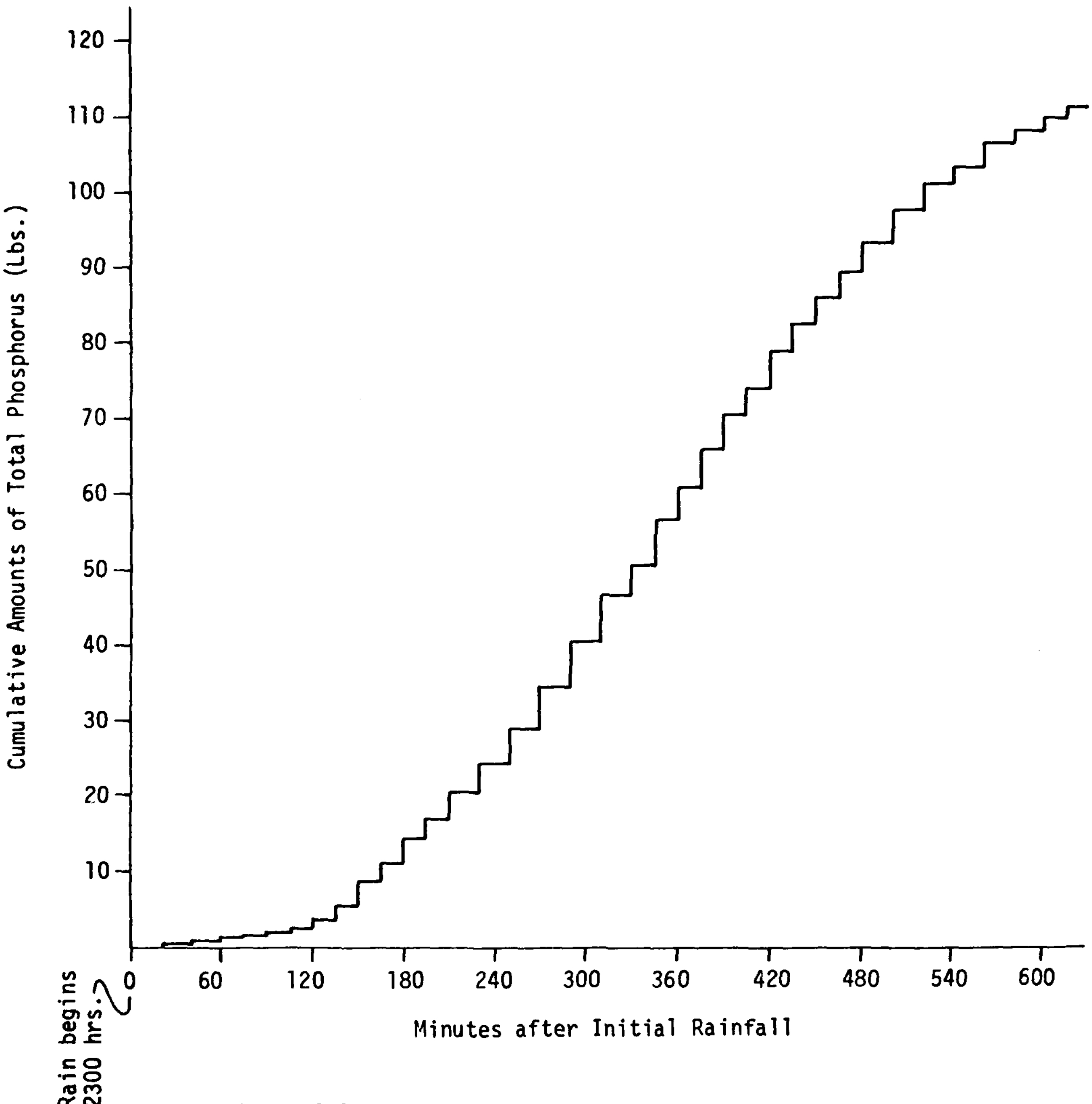


Figure C-41
Phosphorus Loading at Station 4, July 25-26, 1974 Storm

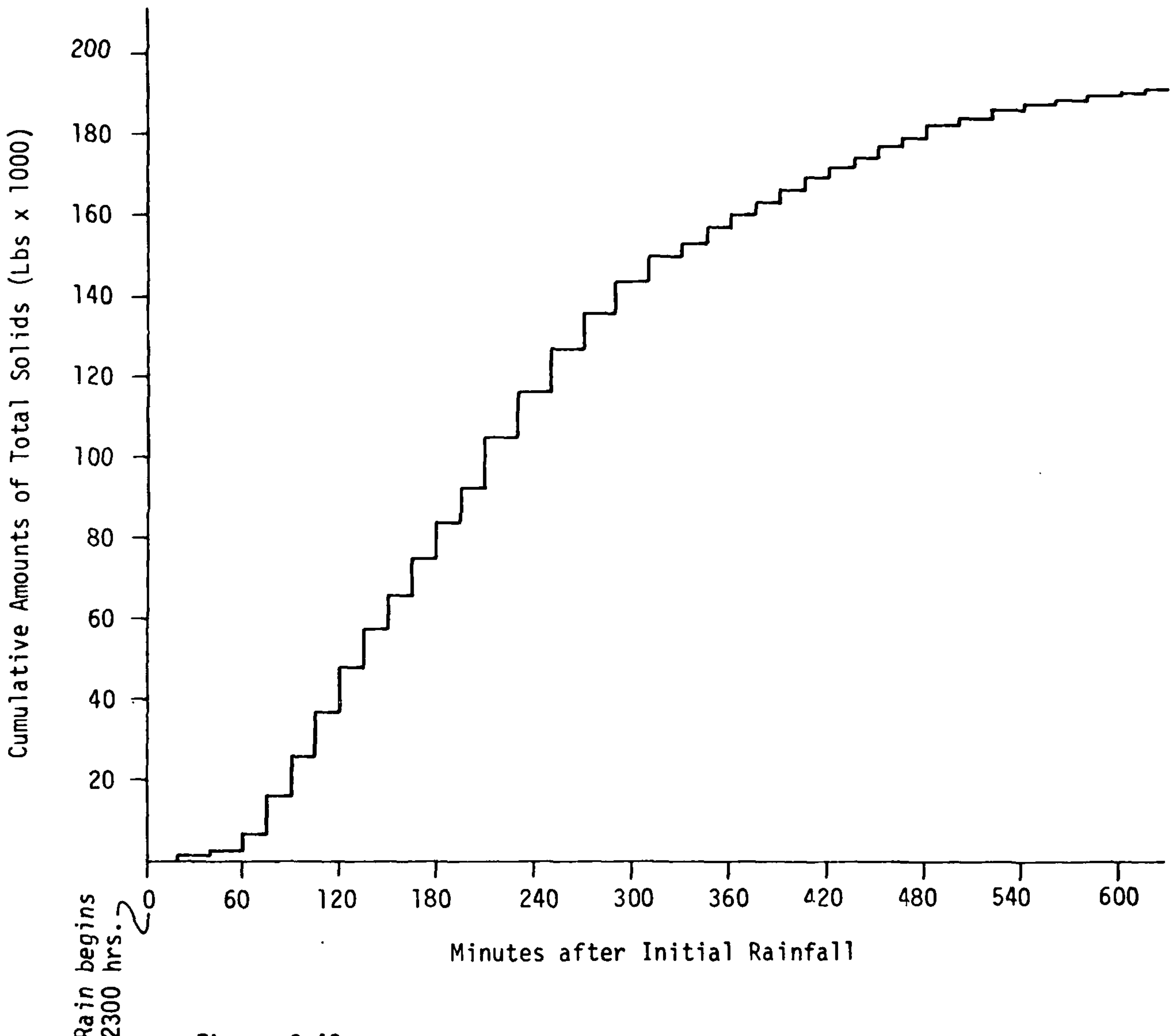


Figure C-42
Total Solids Loading at Station 4, July 25-26, 1974 Storm

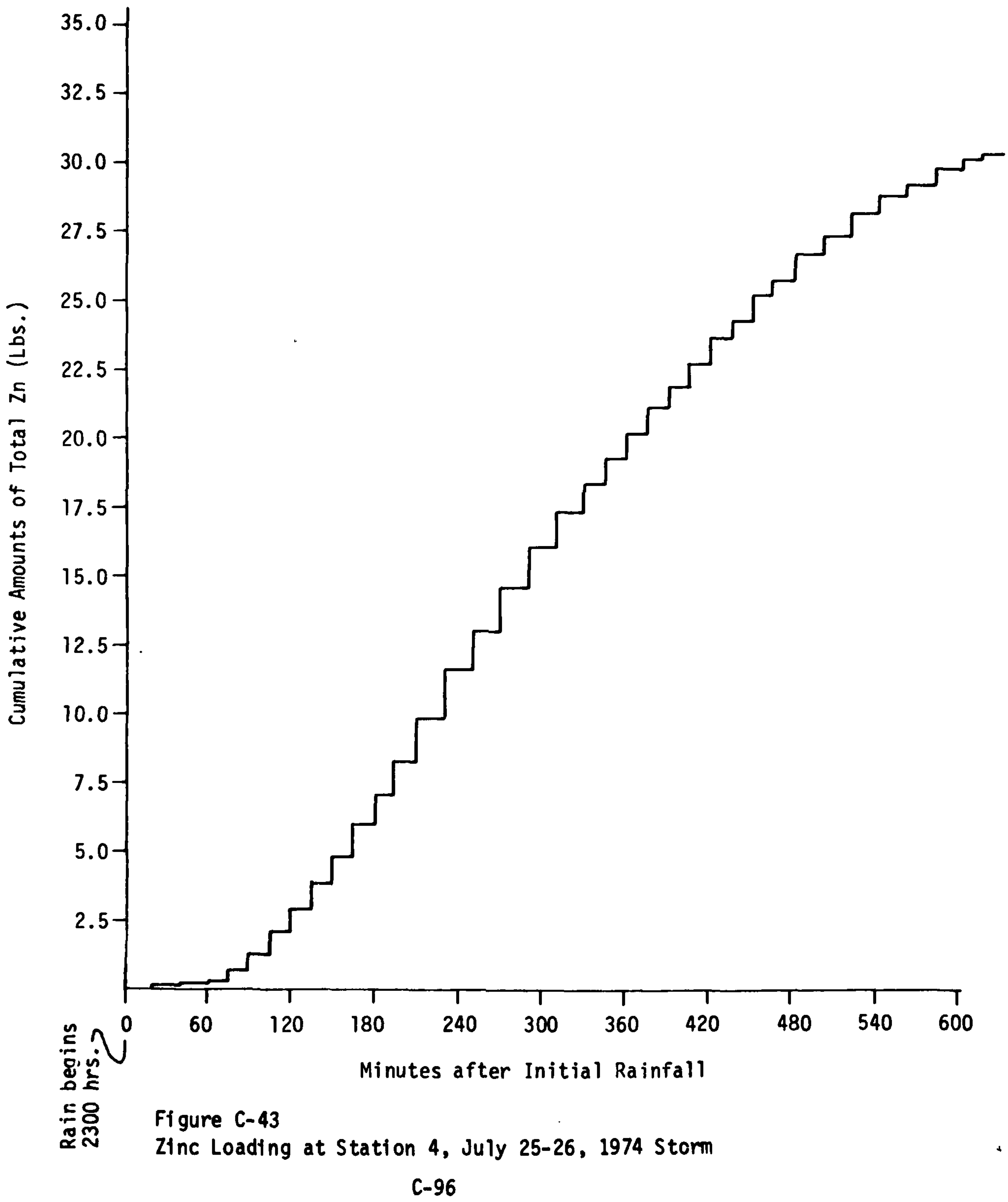


Figure C-43
Zinc Loading at Station 4, July 25-26, 1974 Storm

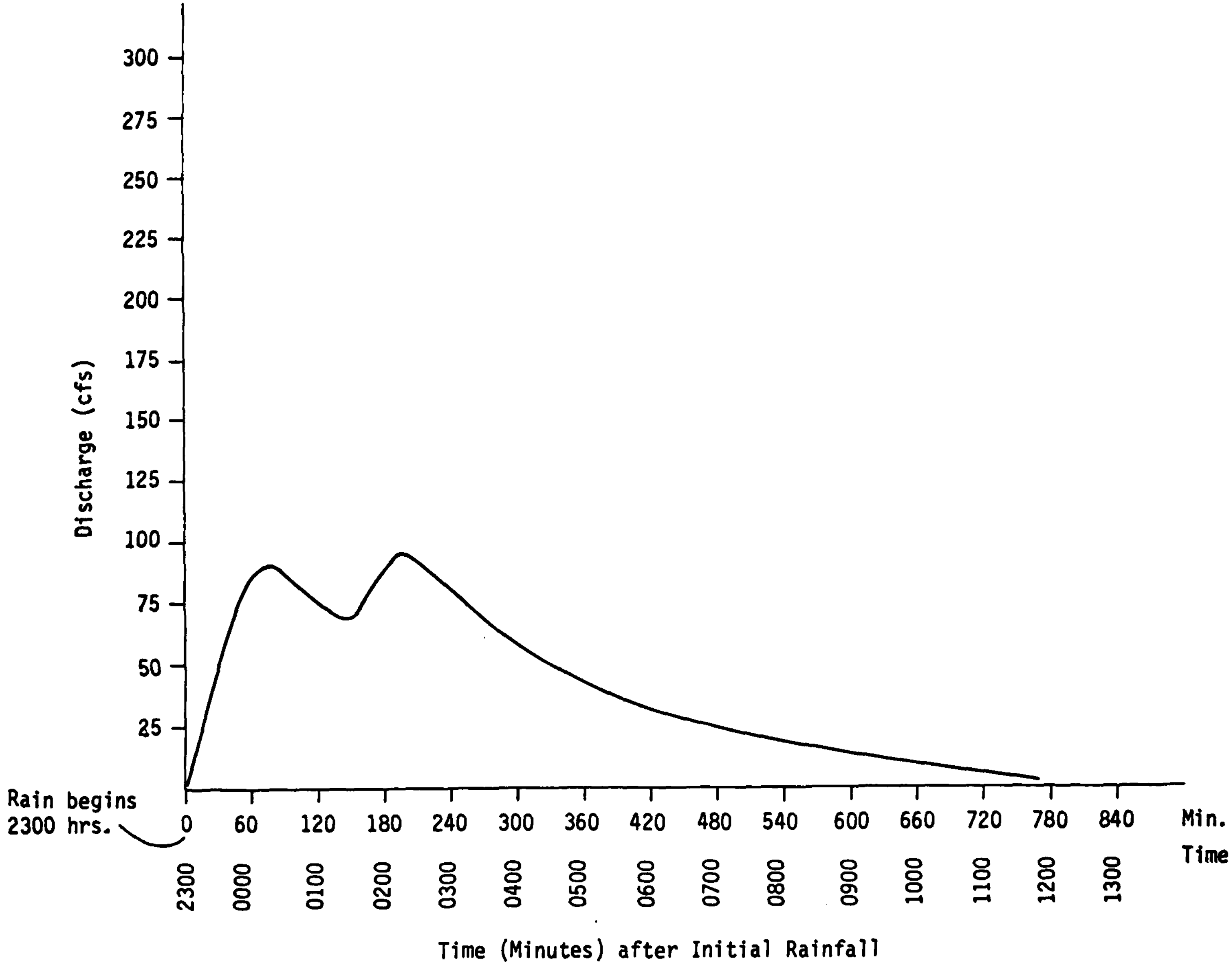


Figure C-44: Discharge Curve at Station 8a, July 25-26, 1974 Storm

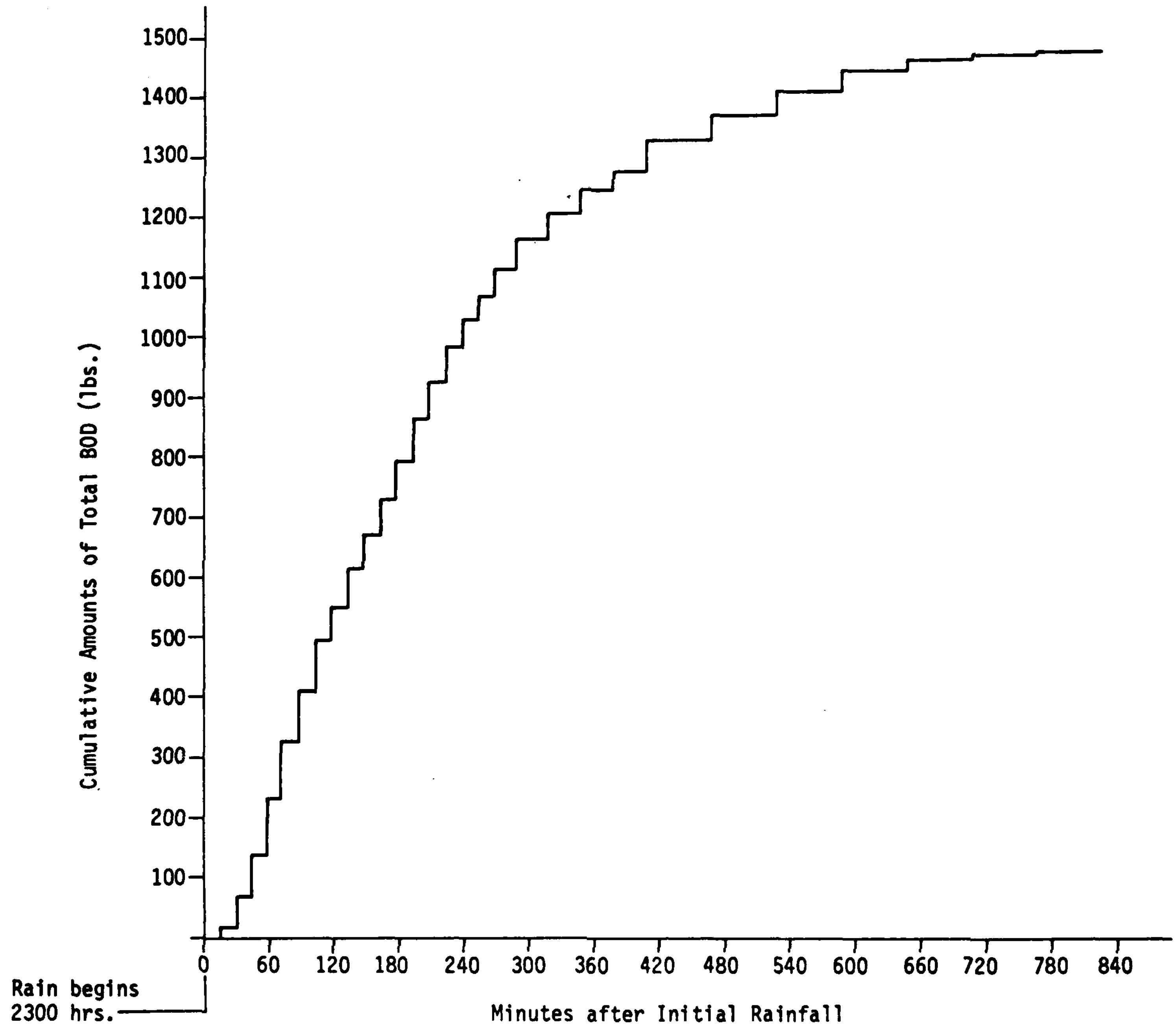


Figure C-45: BOD Loading at Station 8a, July 25-26, 1974 Storm

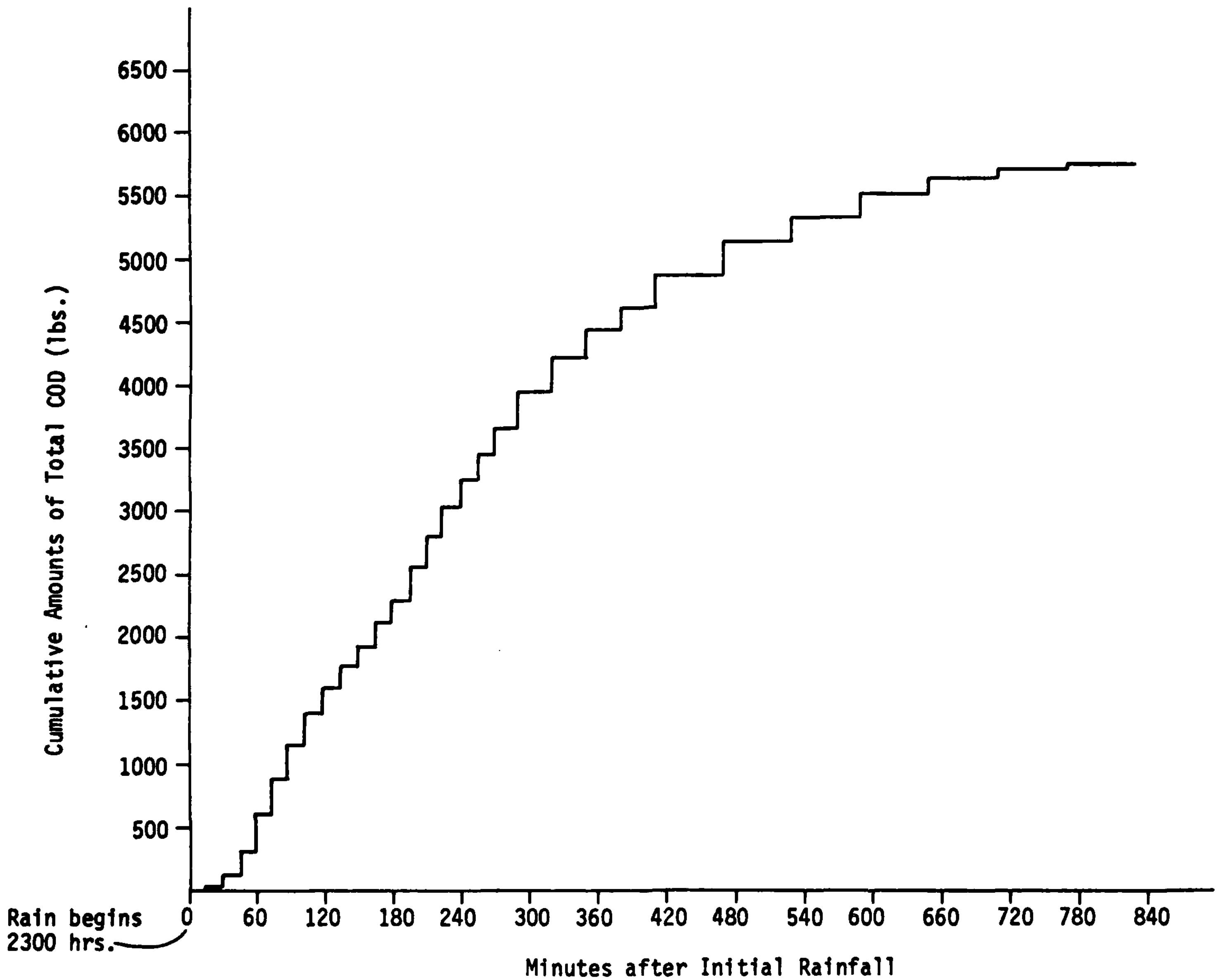


Figure C-46: COD Loading at Station 8a, July 25-26, 1974 Storm

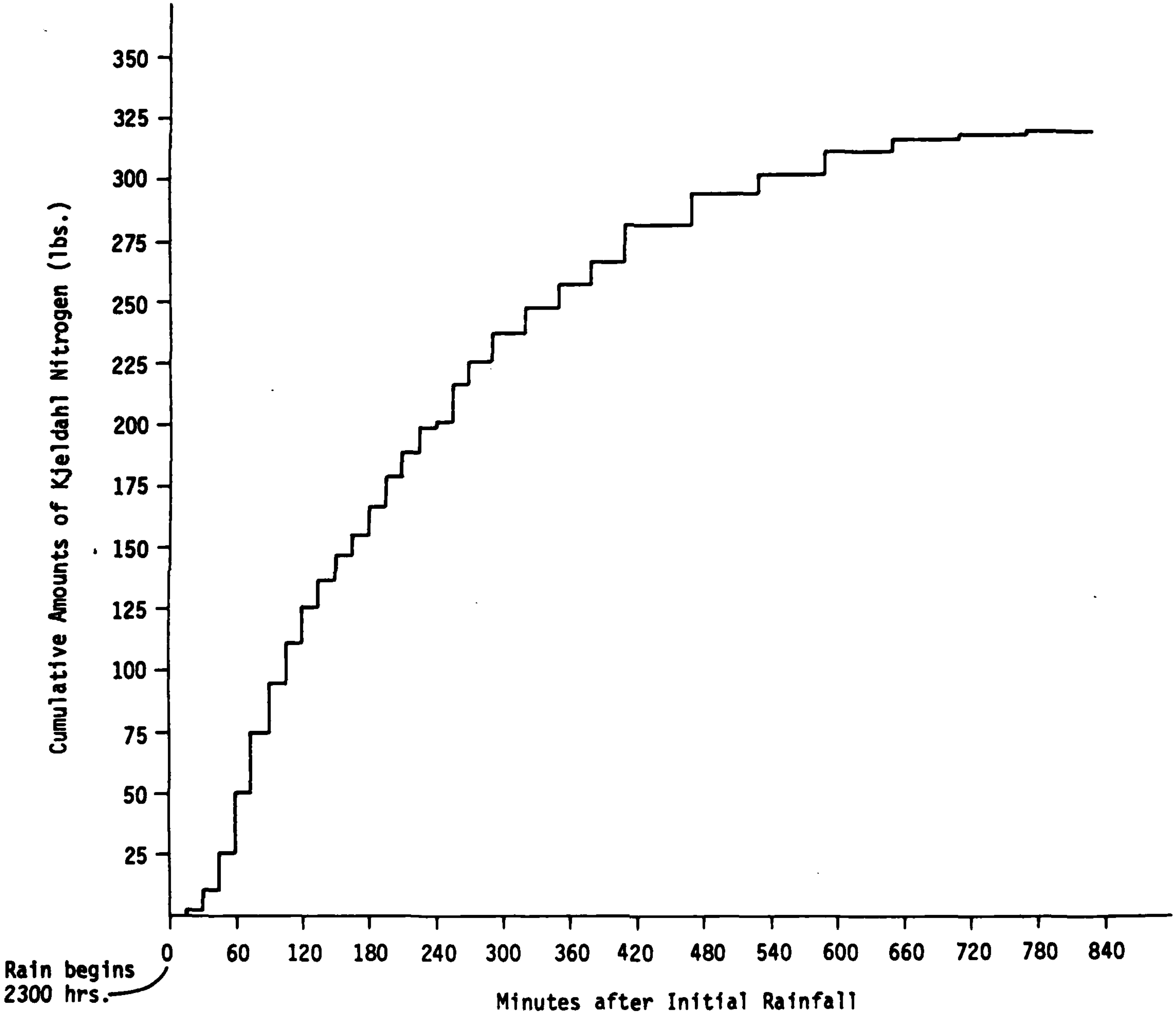


Figure C-47: Kjeldahl Nitrogen Loading at Station 8a, July 25-26, 1974 Storm

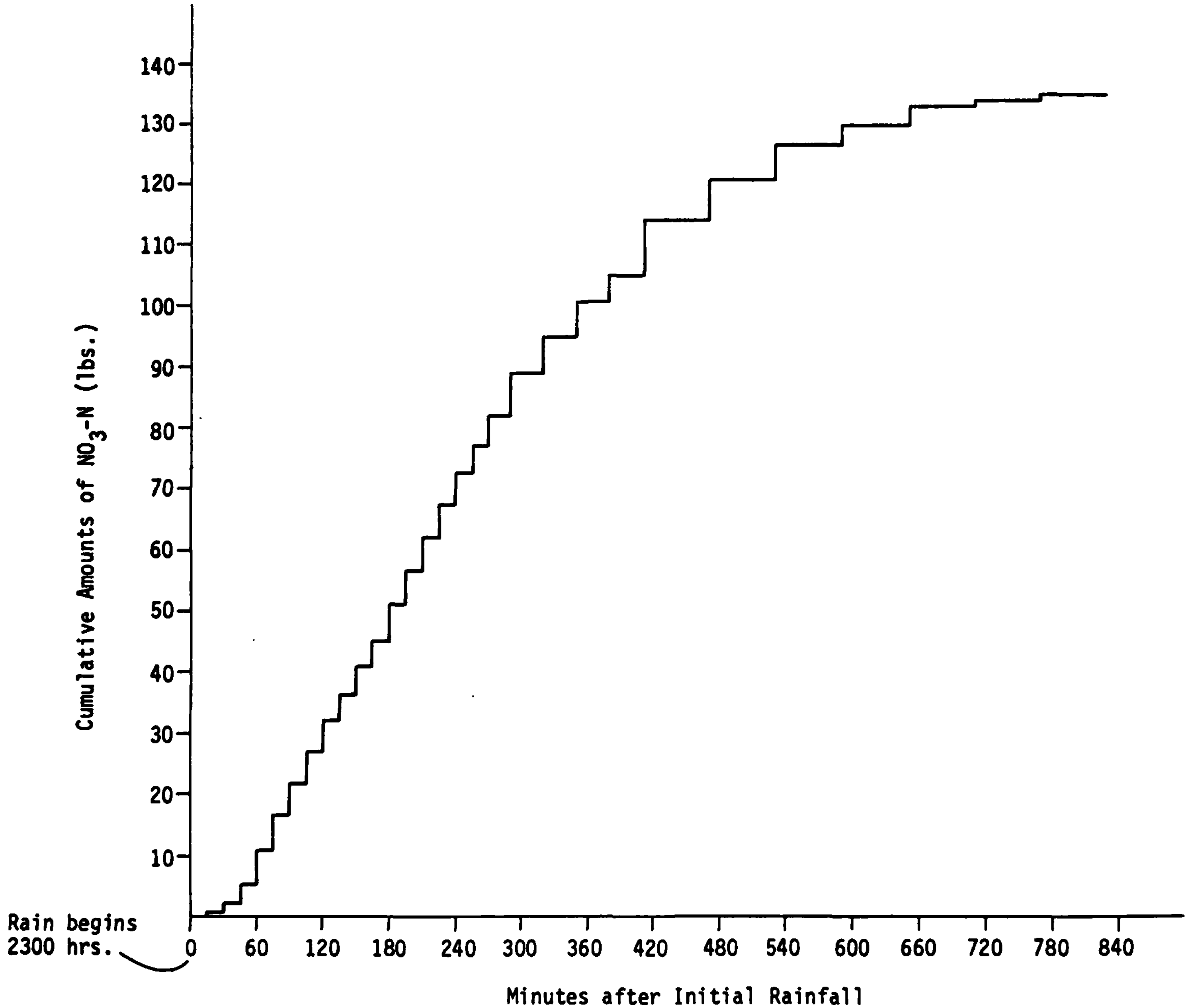


Figure C-48: Nitrate Nitrogen Loading at Station 8a, July 25-26, 1974 Storm

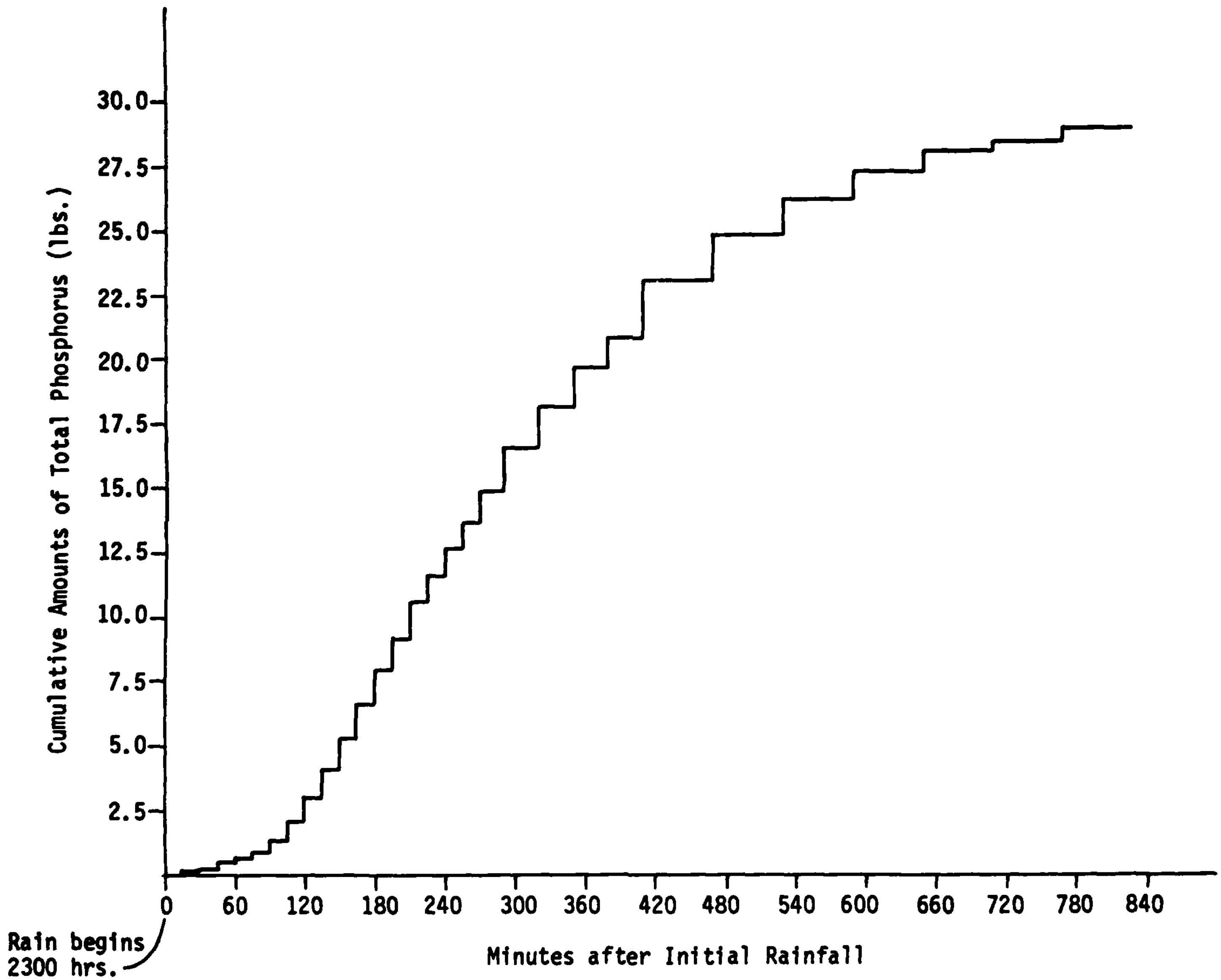


Figure C-49: Phosphorus Loading at Station 8a, July 25-26, 1974 Storm

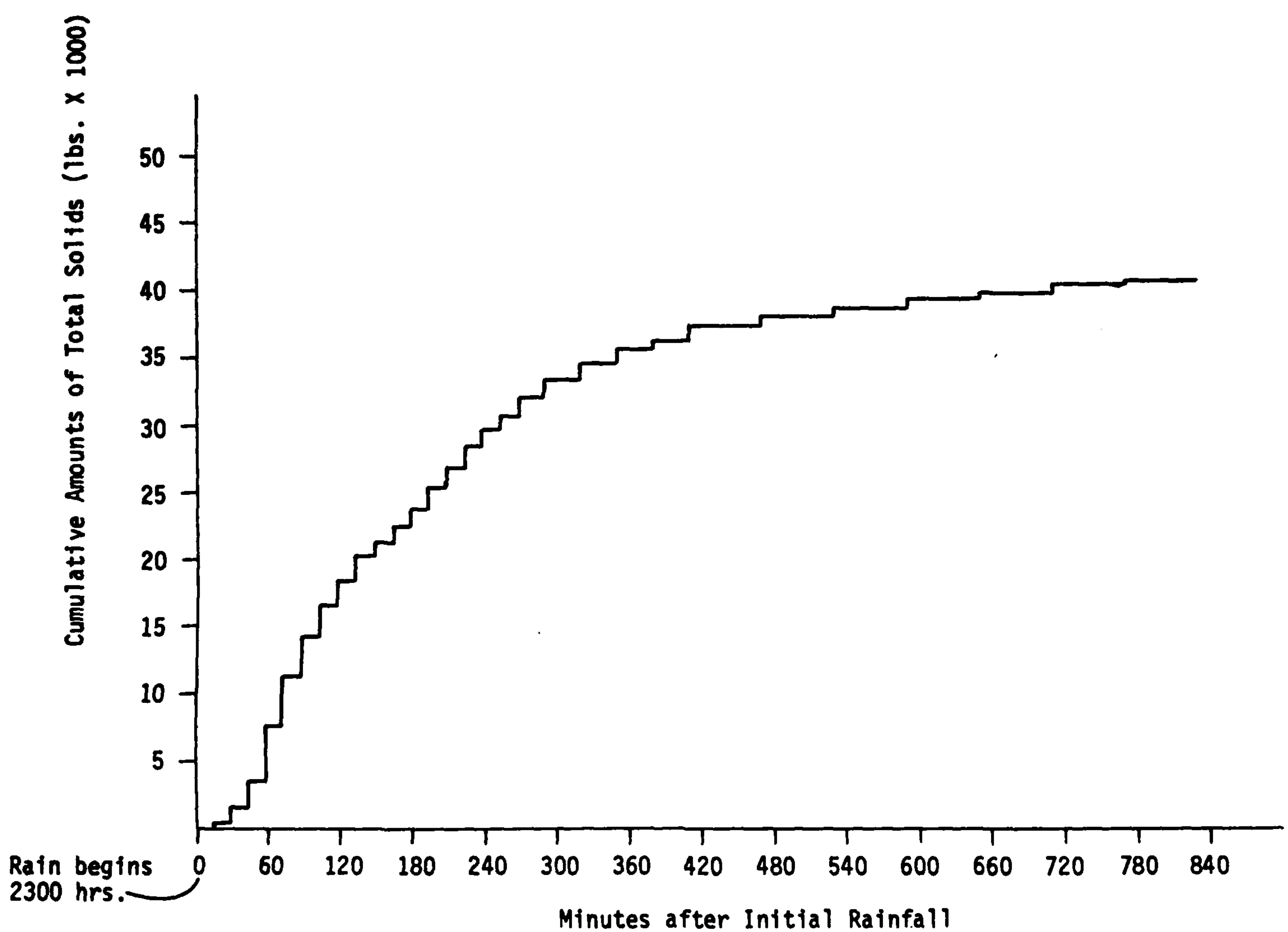


Figure C-50: Total Solids Loading at Station 8a, July 25-26, 1974 Storm

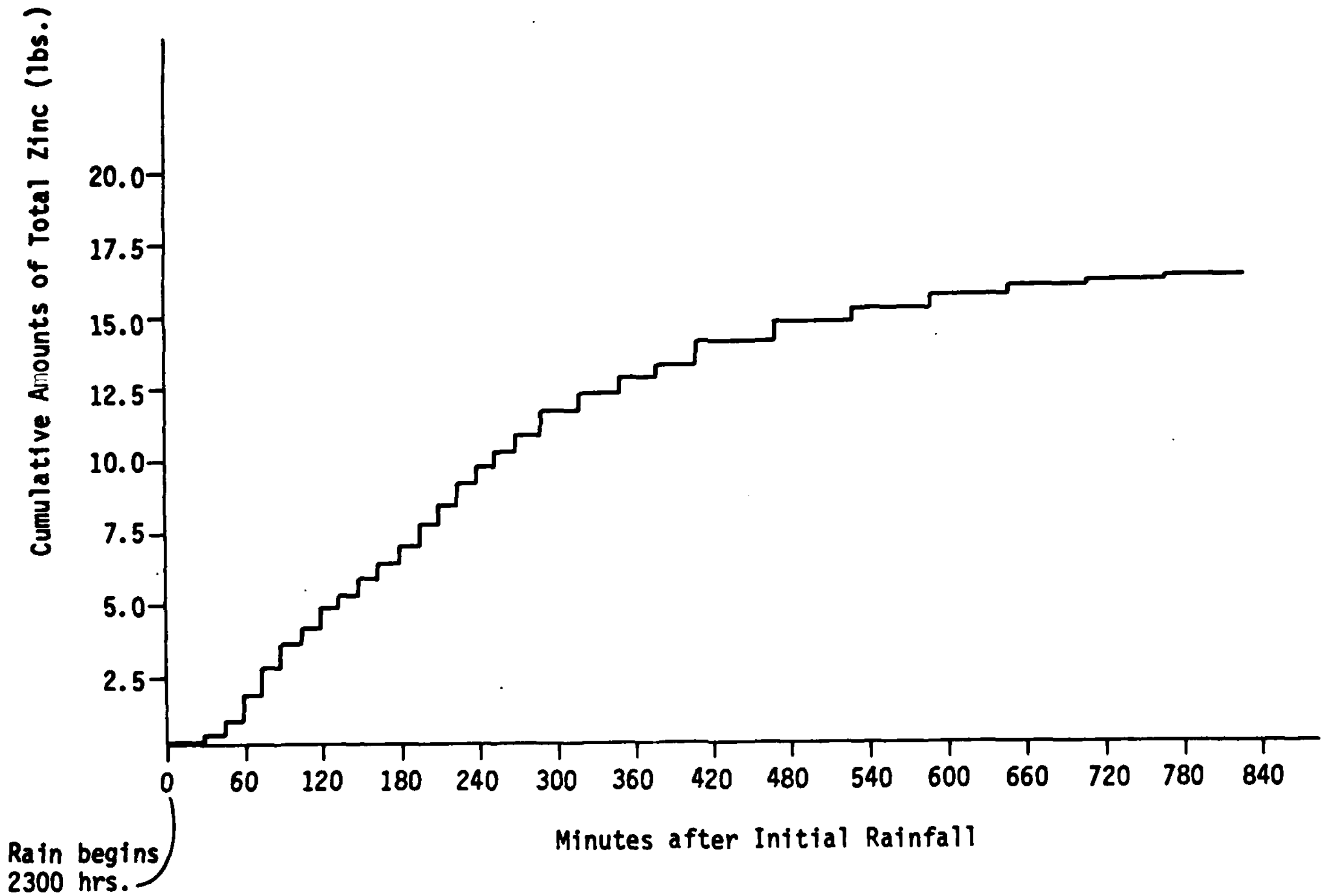


Figure C-51: Zinc Loading at Station 8a, July 25-26, 1974 Storm

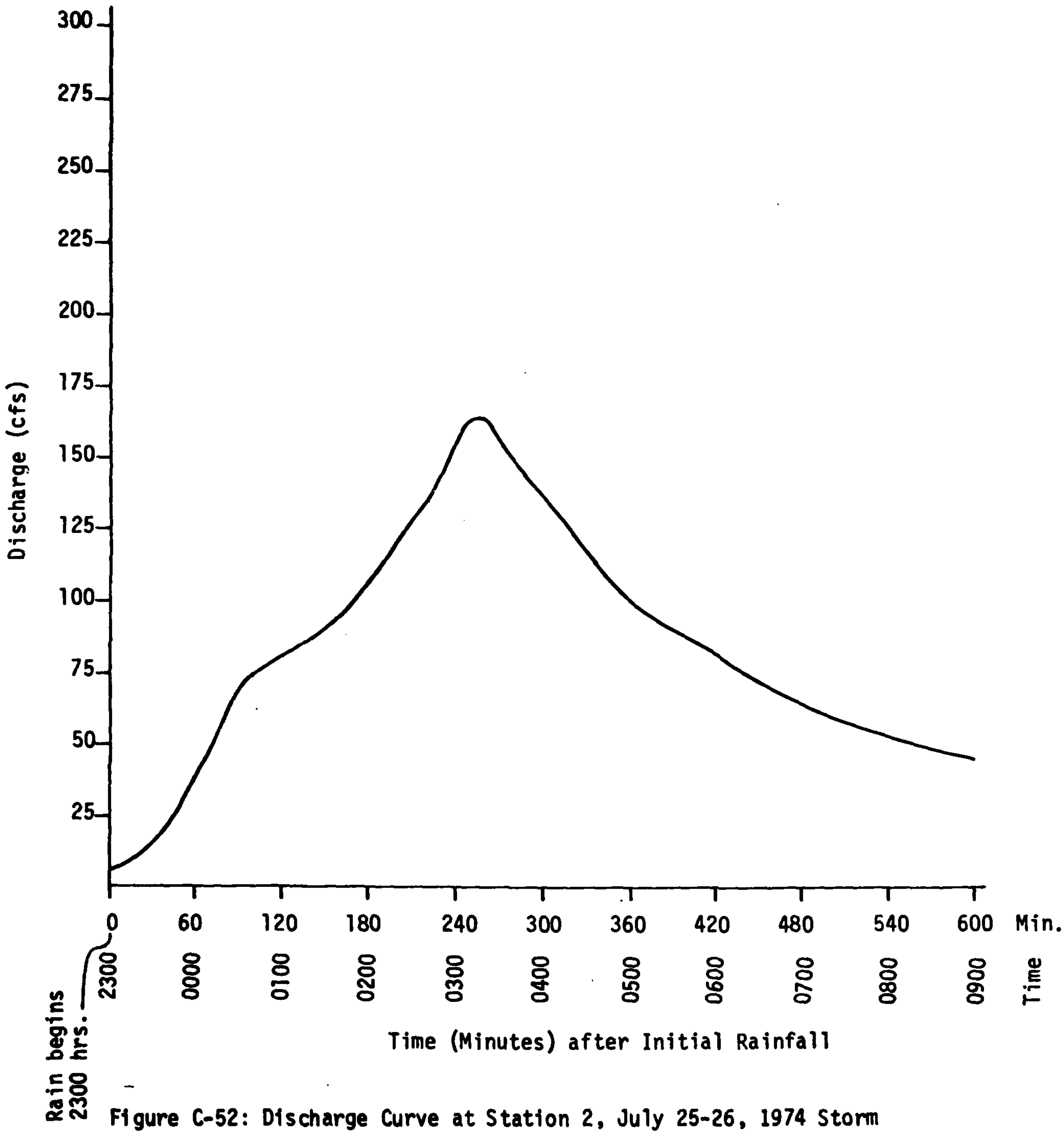


Figure C-52: Discharge Curve at Station 2, July 25-26, 1974 Storm

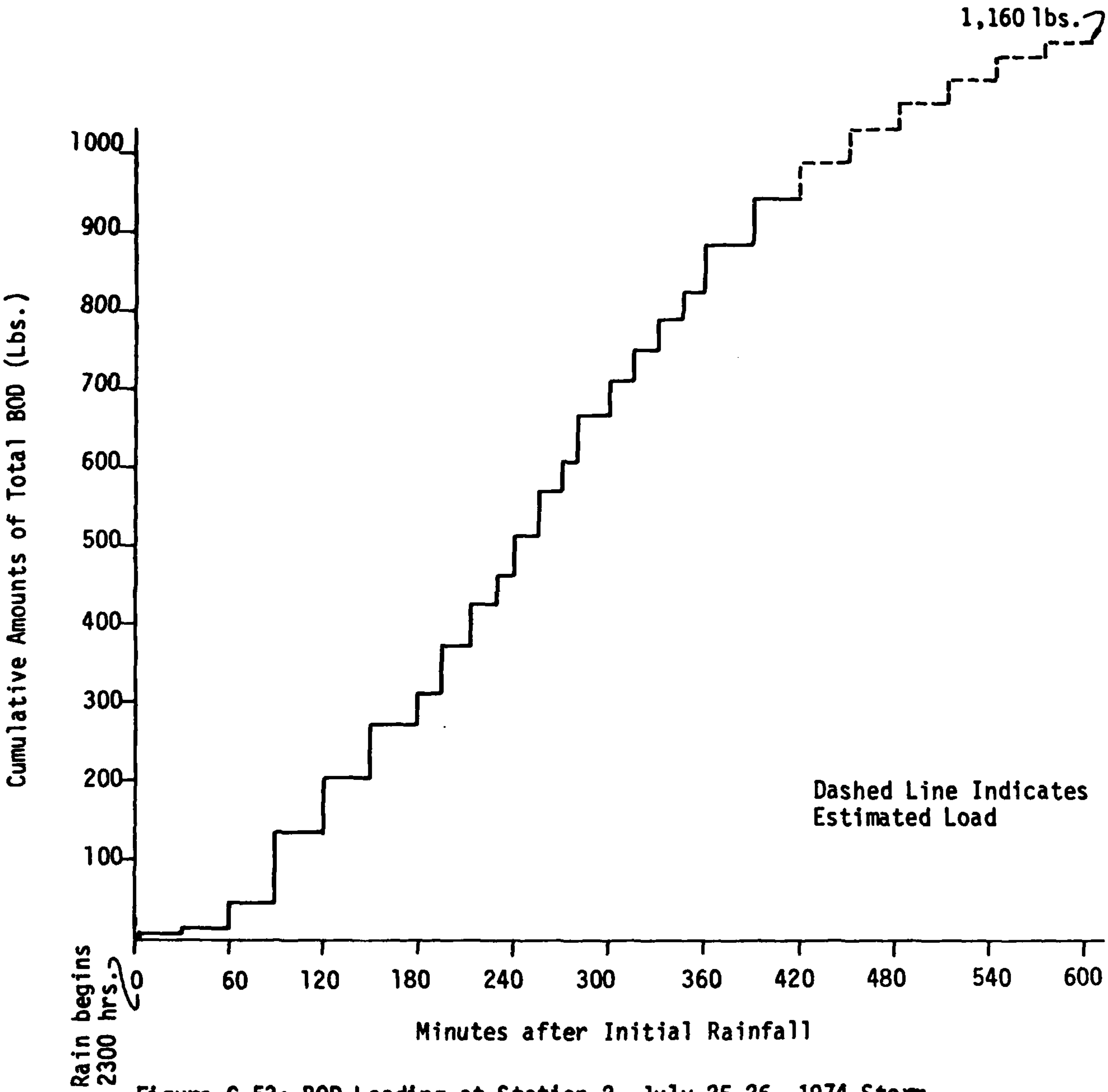


Figure C-53: BOD Loading at Station 2, July 25-26, 1974 Storm

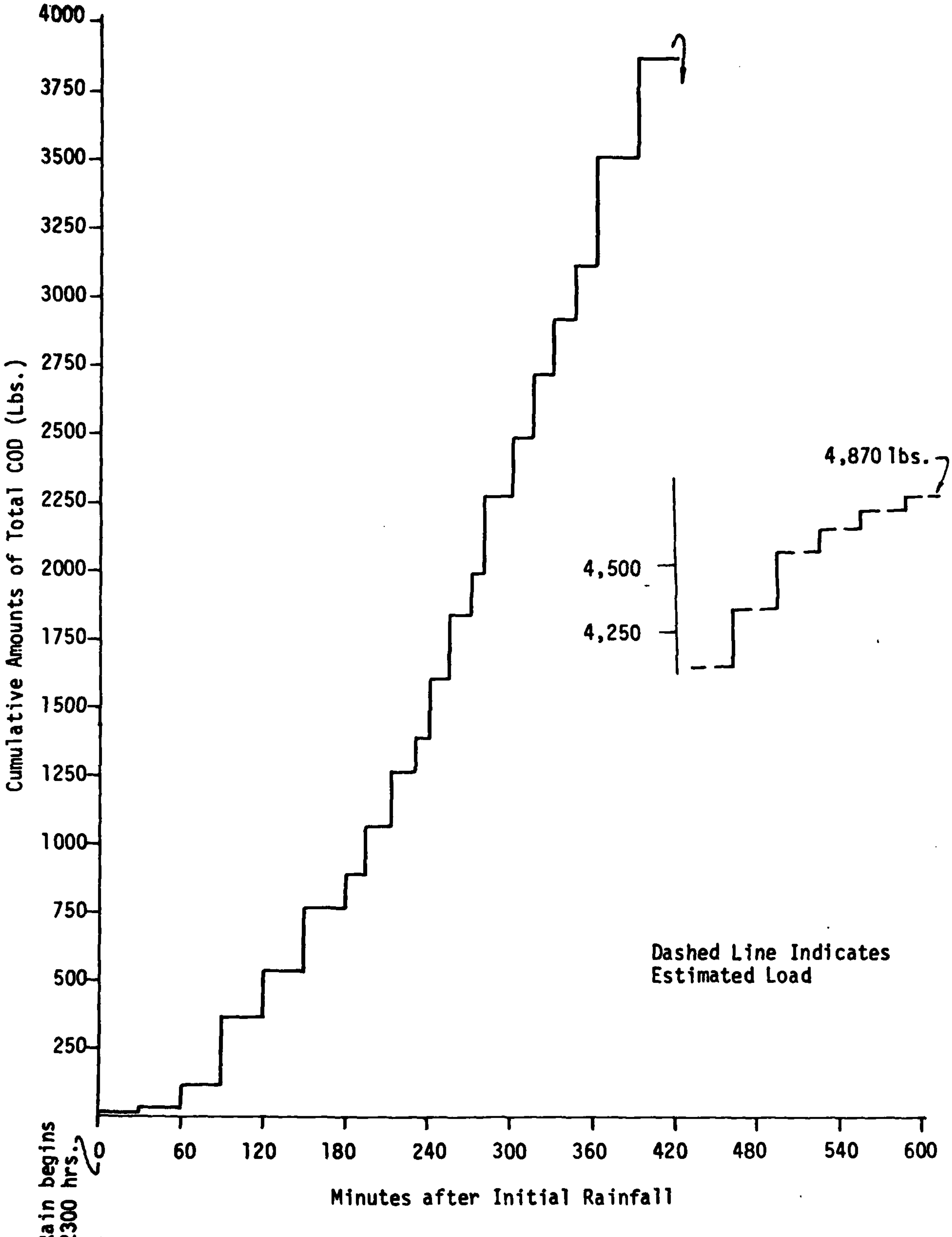


Figure C-54: COD Loading at Station 2, July 25-26, 1974 Storm

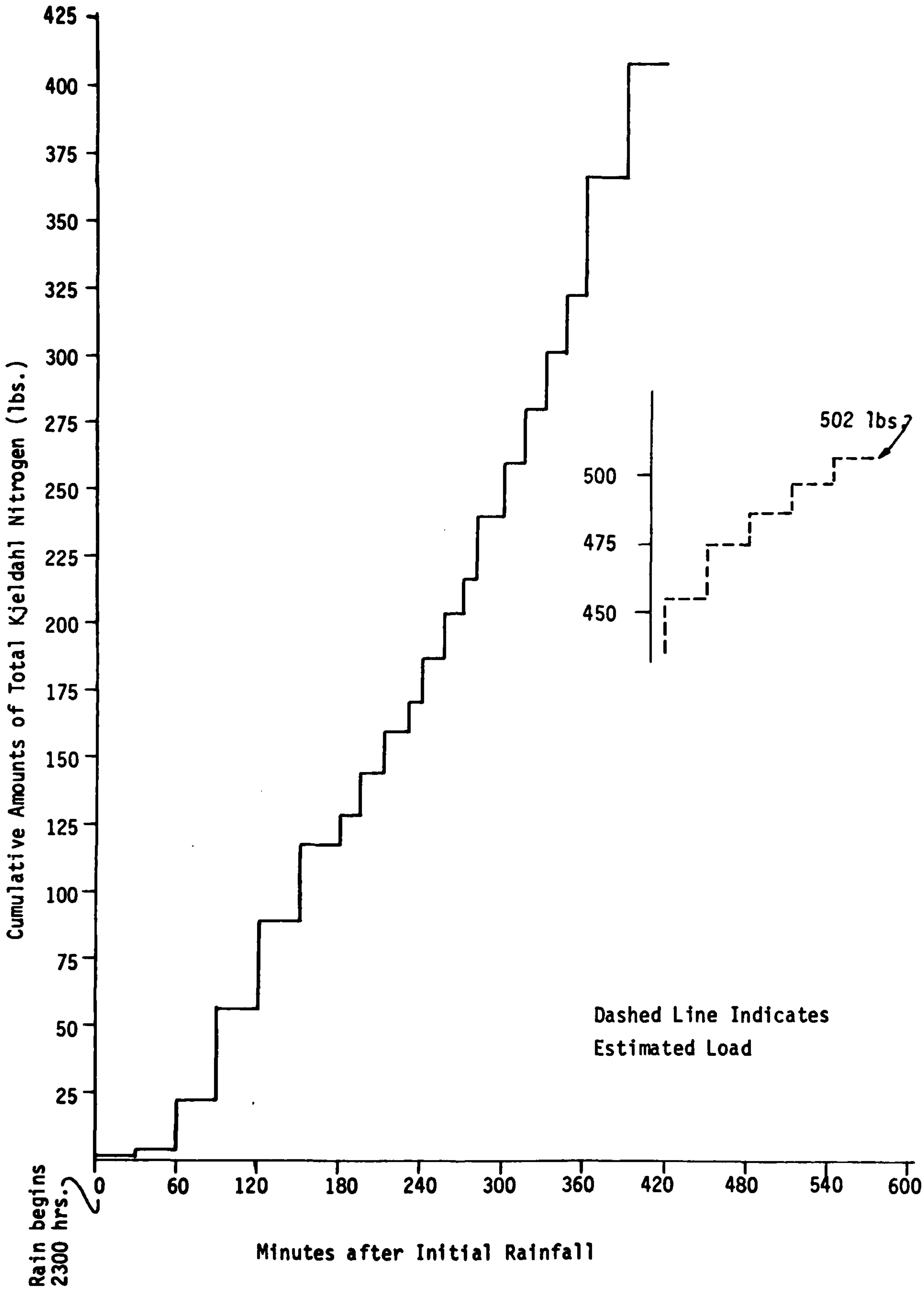


Figure C-55: Kjeldahl Nitrogen Loading at Station 2, July 25-25, 1974 Storm

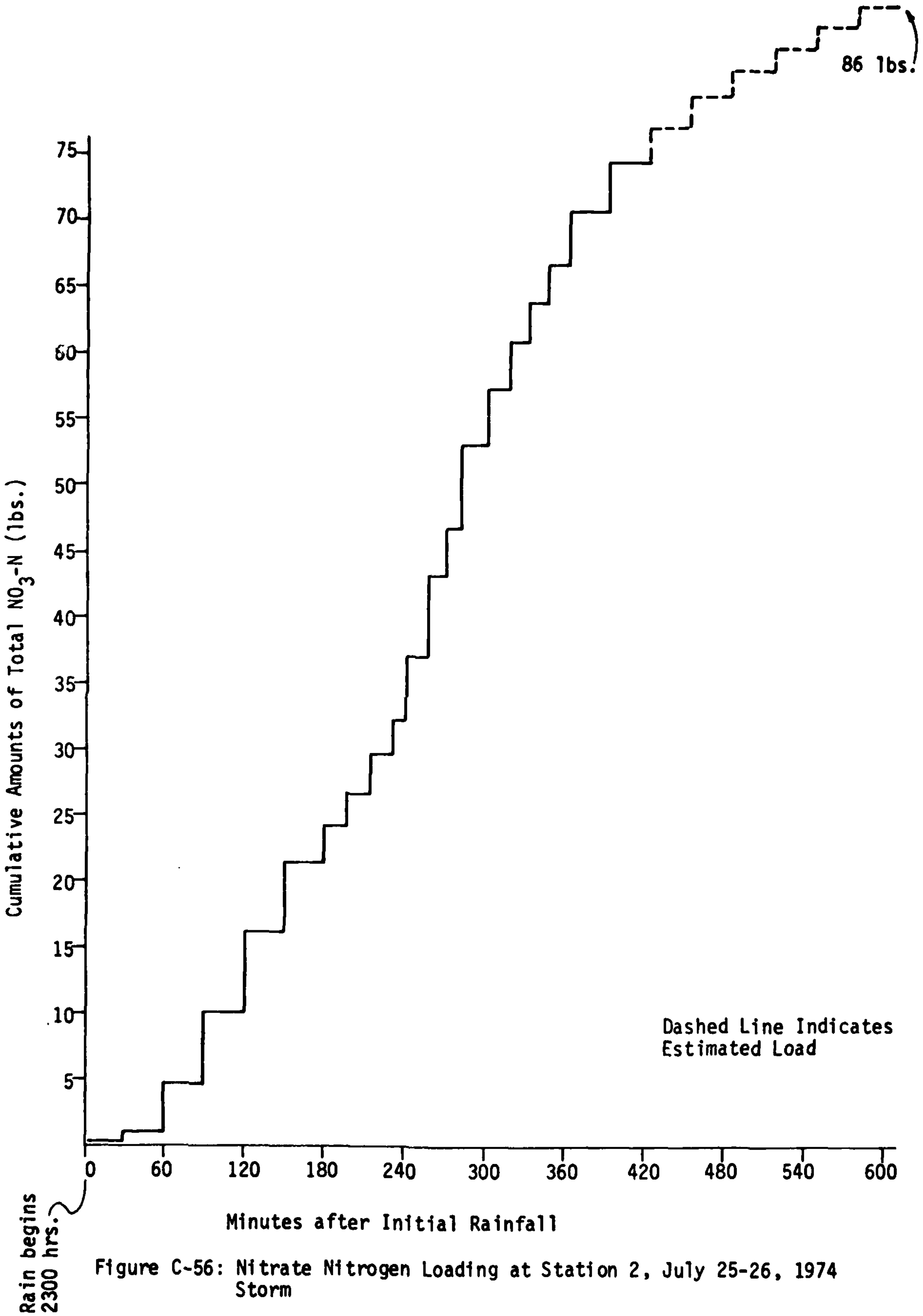


Figure C-56: Nitrate Nitrogen Loading at Station 2, July 25-26, 1974 Storm

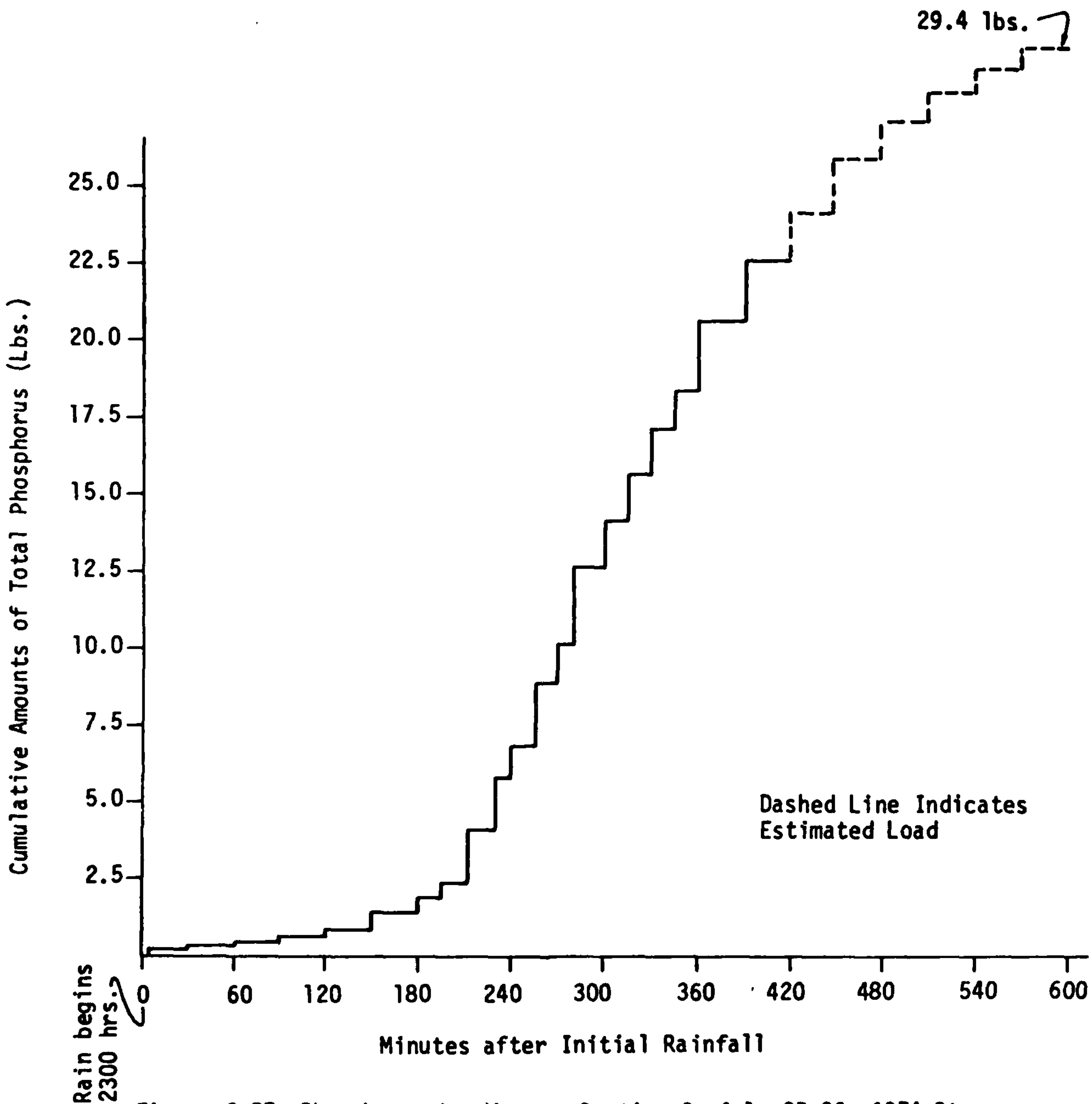


Figure C-57: Phosphorus Loading at Station 2, July 25-26, 1974 Storm

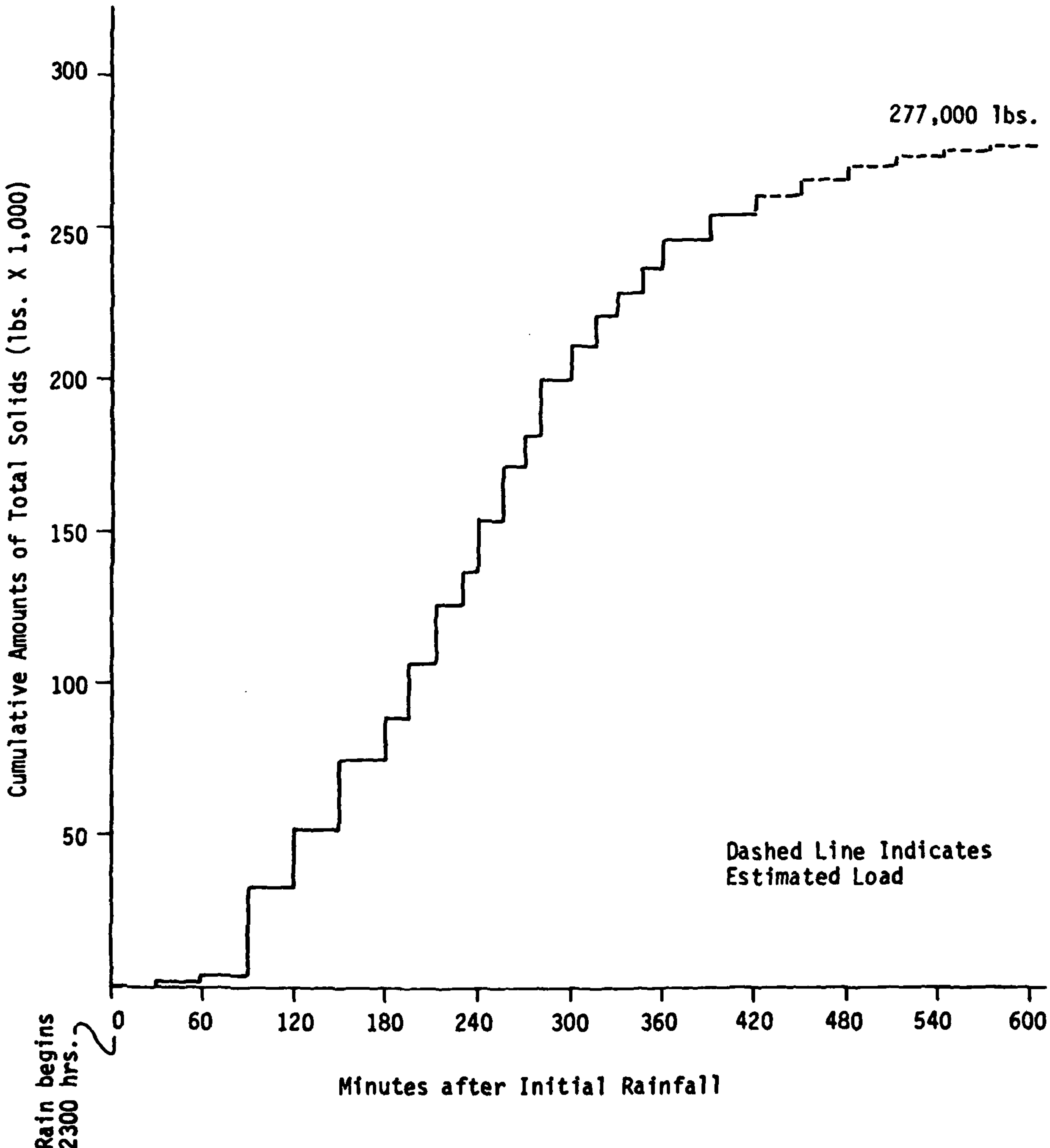


Figure C-58: Total Solids Loading at Station 2, July 25-26, 1974 Storm

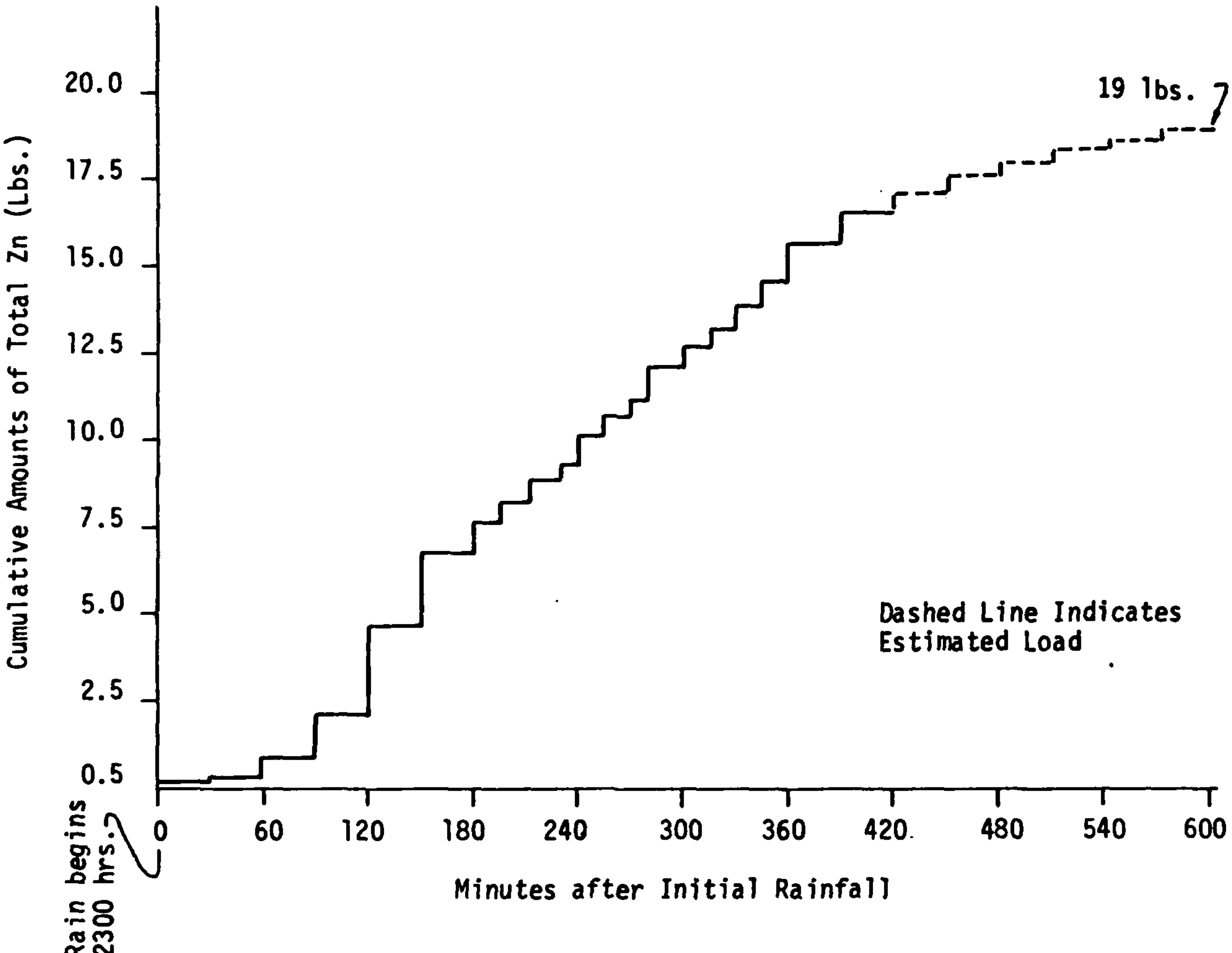


Figure C-59: Zinc Loading at Station 2, July 25-26, 1974 Storm

TABLE C-47
Summary of Baseflow Sampling
Station 1

PARAMETER	SPRING MEAN	SUMMER MEAN	FALL MEAN	WINTER MEAN	ANNUAL MEAN	ANNUAL RANGE
pH	5.9	6.5	6.1	6.4	6.2	5.7 - 6.9
Alkalinity (mg/l $CaCO_3$)	5	23	8	10	12	3.5 - 44
Temperature (°C)	15.5	22.6	14.9	6.6	14.9	4.5 - 24
D.O. (mg/l)	7.9	2.8	5.5	10.8	6.7	0.4 - 12.2
CO_2 (mg/l)	7.8	12.6	8.2	3.3	7.9	2 - 17
True Color (PCU)	53	113	113	78	89	5 - 160
Turbidity (JTU)	<80	<80	<80	<80	<80	-
Secchi Transparency (cm)	-	-	-	-	-	-
Total Coliform (per 100 ml)	18,563	41,567	8,868	23,500	23,125	610 -143,000
Fecal Coliform (per 100 ml)	990	2,145	190	333	915	7 - 5,300
Fecal Streptococci (per 100 ml)	467	1,058	80	562	542	0 - 2,280
B.O.D. (mg/l)	7.4	8.3	3.5	3.7	5.7	1.9 - 24.0
C.O.D. (mg/l)	20	30	26	21	24	6.4 - 36.0
Ammonia (mg/l N)	0.19	0.12	0.25	0.10	0.17	0.05- 0.30
Nitrite (mg/l N)	0.0	0.0	0.0	0.0	0.0	0.05- 0.30
Nitrate (mg/l N)	0.25	0.42	0.87	0.30	0.48	0.0 - 0.01
Total Kjeldahl (mg/l)	1.03	1.23	1.70	0.63	1.19	0.15- 1.18
Total Phosphorus (mg/l)	0.025	0.123	0.105	0.048	0.075	0.46- 2.7
Total Solids (mg/l)	92	120	113	119	111	0.0 - 0.31
Suspended Solids (mg/l)	6	24	12	36	20	74 - 181
Volatile Solids (mg/l)	34	50	46	60	47	0 - 87
Specific Conductance (micromhos/cm)	45	72	51	35	51	16 - 109
Sodium (mg/l)	-	-	-	-	-	30 - 110
Sulfate (mg/l)	-	-	-	-	-	
Chloride (mg/l)	-	-	-	-	-	
Iron (mg/l)	-	-	-	-	-	
Manganese (mg/l)	-	-	-	-	-	
Total Hardness (mg/l CaCO3)	16	27	20	16	20	13 - 47
Calcium Hardness (mg/l $CaCO_3$)	7.6	18.6	10.7	6.4	11	4.7 - 35
Oils & Grease (mg/l)	1.98	1.05	0.00	0.32	0.79	0.0 - 5.3

TABLE C-48
Summary of Baseflow Sampling
Station 2

PARAMETER	SPRING MEAN	SUMMER MEAN	FALL MEAN	WINTER MEAN	ANNUAL MEAN	ANNUAL RANGE
pH	7.3	7.4	7.5	7.4	7.4	6.9 - 7.9
Alkalinity (mg/l $CaCO_3$)	54	54	52	56	54	22 - 70
Temperature (°C)	21.8	25.7	17.1	13.6	19.5	6.0 - 26
D.O. (mg/l)	7.6	7.2	9.2	9.9	8.4	5.7 - 11.2
CO_2 (mg/l)	6.0	7.0	4.3	4.2	5.4	3 - 10
True Color (PCU)	35	78	67	113	73	10 - 180
Turbidity (JTU)	<80	<80	<80	<80	<80	-
Secchi Transparency (cm)	-	-	-	-	-	-
Total Coliform (per 100 ml)	29,167	43,700	14,774	48,933	34,143	0 -291,000
Fecal Coliform (per 100 ml)	329	2,492	328	933	1,021	0 - 6,910
Fecal Streptococci (per 100 ml)	157	473	20	1,350	500	0 - 8,100
B.O.D. (mg/l)	4.7	14.2	2.8	2.8	6.1	0.1 - 65
C.O.D. (mg/l)	12	22	25	20	20	5 - 45
Ammonia (mg/l N)	0.21	0.10	0.25	0.13	0.17	0.05- 0.46
Nitrite (mg/l N)	0.02	0.02	0.03	0.02	0.02	0.00- 0.05
Nitrate (mg/l N)	0.27	0.35	0.82	0.4	0.46	0.14- 9.4
Total Kjeldahl (mg/l)	0.86	1.12	1.34	0.70	1.03	0.1 - 2.32
Total Phosphorus (mg/l)	0.22	0.14	0.21	0.39	0.24	0.04- 0.85
Total Solids (mg/l)	120	146	138	201	151	74 - 299
Suspended Solids (mg/l)	16	23	20	81	35	0 - 191
Volatile Solids (mg/l)	40	46	48	58	48	20 - 77
Specific Conductance (micromhos/cm)	127	138	118	102	121	50 - 150
Sodium (mg/l)	-	-	-	-	-	
Sulfate (mg/l)	-	-	-	-	-	
Chloride (mg/l)	-	-	-	-	-	
Iron (mg/l)	-	-	-	-	-	
Manganese (mg/l)	-	-	-	-	-	
Total Hardness (mg/l $CaCO_3$)	27	28	30	29	29	24 - 35
Calcium Hardness (mg/l $CaCO_3$)	20.8	21.5	19.5	19.2	20	15 - 27
Oils & Grease (mg/l)	78	1.12	1.98	0.55	1.11	0.0 - 9.3

TABLE C-49
Summary of Baseflow Sampling
Station 3

PARAMETER	SPRING MEAN	SUMMER MEAN	FALL MEAN	WINTER MEAN	ANNUAL MEAN	ANNUAL RANGE
pH	6.4	6.6	6.2	6.5	6.4	5.6 - 7.0
Alkalinity (mg/l $CaCO_3$)	9	22	24	9	16	5 - 88
Temperature (°C)	17.3	26.1	17.1	8.2	17.2	6.0 - 29.0
D.O. (mg/l)	5.4	4.3	5.9	10.3	6.4	1.0 - 11.6
CO_2 (mg/l)	9.1	11.0	9.7	4.8	8.7	3 - 16
True Color (PCU)	56	114	128	88	96	10 - 190
Turbidity (JTU)	<80	<80	<80	<80	<80	-
Secchi Transparency (cm)	-	-	-	-	-	-
Total Coliform (per 100 ml)	32,017	27,150	22,953	61,483	35,901	820 -254,000
Fecal Coliform (per 100 ml)	732	1,552	547	1,813	1,161	0 - 6,300
Fecal Streptococci (per 100 ml)	1,310	302	522	2,757	1,174	0 - 10,900
B.O.D. (mg/l)	4.5	14.1	3.2	3.4	6.3	1.2 - 30
C.O.D. (mg/l)	18	22	23	25	23	7 - 46
Ammonia (mg/l N)	0.21	0.20	0.23	0.10	0.19	0.04- 0.42
Nitrite (mg/l N)	0	0	0	0	0	0.0 - 0.01
Nitrate (mg/l N)	0.35	0.30	0.95	0.48	0.52	0.11- 17
Total Kjeldahl (mg/l)	1.43	1.71	1.86	0.98	1.54	0.1 - 2.5
Total Phosphorus (mg/l)	0.07	0.15	0.14	0.09	0.11	0.01- 0.26
Total Solids (mg/l)	114	131	134	144	131	78 - 215
Suspended Solids (mg/l)	28	33	29	56	36	3 - 66
Volatile Solids (mg/l)	47	48	50	64	52	21 - 104
Specific Conductance (micromhos/cm)	53	96	54	39	59	30 - 125
Sodium (mg/l)	-	-	-	-	-	
Sulfate (mg/l)	-	-	-	-	-	
Chloride (mg/l)	-	-	-	-	-	
Iron (mg/l)	-	-	-	-	-	
Manganese (mg/l)	-	-	-	-	-	
Total Hardness (mg/l CaCO3)	17	19	20	17	18	12 - 25
Calcium Hardness (mg/l $CaCO_3$)	10.0	11.9	10.8	7.8	10.0	6.2 - 14.5
Oils & Grease (mg/l)	2.77	0.45	0.08	0.00	0.86	0.0 - 7.3

TABLE C-50
Summary of Baseflow Sampling
Station 4

PARAMETER	SPRING MEAN	SUMMER MEAN	FALL MEAN	WINTER MEAN	ANNUAL MEAN	ANNUAL RANGE
pH	6.9	6.9	6.7	6.9	6.9	6.2 - 7.5
Alkalinity (mg/1 $CaCO_3$)	60	74	60	72	66	21 - 131
Temperature (°C)	18.3	26.5	17.7	8.3	17.7	6.5 - 28.0
D.O. (mg/1)	3.9	2.6	3.6	5.9	3.9	0.2 - 9.4
CO_2 (mg/1)	13.0	14.6	13.0	12.8	13.4	4.0 - 23.0
True Color (PCU)	46	101	78	118	86	10 - 170
Turbidity (JTU)	<80	<80	<80	<80	<80	-
Secchi Transparency (cm)	-	-	-	-	-	-
Total Coliform (per 100 ml)	114,933	143,817	103,400	99,017	118,478	6,400 -620,000
Fecal Coliform (per 100 ml)	7,970	2,803	4,983	1,233	4,432	140 - 39,000
Fecal Streptococci (per 100 ml)	893	556	1,265	1,308	1,025	140 - 4,200
B.O.D. (mg/1)	7.1	14.4	6.1	4.2	7.2	3.7 - 32
C.O.D. (mg/1)	23	33	23	25	26	5 - 48
Ammonia (mg/1 N)	0.57	0.38	0.61	1.06	0.59	0.06- 1.48
Nitrite (mg/1 N)	0.02	0.02	0.05	0.01	0.02	0 - 0.02
Nitrate (mg/1 N)	0.54	0.53	1.19	0.81	0.76	0.14- 3.04
Total Kjeldahl (mg/1)	2.16	2.75	2.39	2.46	2.44	1.8 - 4.5
Total Phosphorus (mg/1)	0.27	0.15	0.33	0.18	0.23	0.04- 0.93
Total Solids (mg/1)	142	187	180	187	174	80 - 247
Suspended Solids (mg/1)	15	29	29	47	30	0 - 56
Volatile Solids (mg/1)	52	76	67	87	70	15 - 148
Specific Conductance (micromhos/cm)	150	217	160	133	169	62 - 345
Sodium (mg/1)	-	-	-	-	-	
Sulfate (mg/1)	-	-	-	-	-	
Chloride (mg/1)	-	-	-	-	-	
Iron (mg/1)	-	-	-	-	-	
Manganese (mg/1)	-	-	-	-	-	
Total Hardness (mg/1 CaCO3)	57	69	62	68	64	24 - 105
Calcium Hardness (mg/1 $CaCO_3$)	39.7	50.8	41.9	42.8	43.8	16 - 84
Oils & Grease (mg/1)	2.77	3.73	4.03	0.48	2.75	0.0 - 18.0

TABLE C-51
Summary of Baseflow Sampling
Station 5

PARAMETER	SPRING MEAN	SUMMER MEAN	FALL MEAN	WINTER MEAN	ANNUAL MEAN	ANNUAL RANGE
pH	6.4	6.8	6.5	6.6	6.6	5.8 - 7.6
Alkalinity (mg/l $CaCO_3$)	17	38	18	16	22	6 - 60
Temperature (°C)	18.9	26.8	17.8	8.0	17.9	6 - 29
D.O. (mg/l)	4.8	2.9	4.7	8.9	5.3	1.5 - 10.5
CO_2 (mg/l)	9.7	12.7	7.8	4.0	8.6	3 - 16.0
True Color (PCU)	63	123	105	88	95	5 - 195
Turbidity (JTU)	<80	<80	<80	<80	<80	-
Secchi Transparency (cm)	-	-	-	-	-	-
Total Coliform (per 100 ml)	12,500	8,217	10,778	18,033	12,382	170 -63,000
Fecal Coliform (per 100 ml)	615	521	620	438	549	0 - 2,200
Fecal Streptococci (per 100 ml)	209	249	130	287	219	0 - 730
B.O.D. (mg/l)	4.9	12.6	2.5	3.3	5.8	0.7 - 46
C.O.D. (mg/l)	26	31	20	24	25	11 - 45
Ammonia (mg/l N)	0.26	0.29	0.30	0.55	0.33	0.6 - 1.8
Nitrite (mg/l N)	0	0	0	0	0	0
Nitrate (mg/l N)	0.57	0.43	1.07	0.48	0.64	0.27- 2.98
Total Kjeldahl (mg/l)	1.34	2.95	1.53	1.60	1.88	0.2 - 6.4
Total Phosphorus (mg/l)	0.12	0.17	0.24	0.11	0.16	0.02- 0.35
Total Solids (mg/l)	110	141	112	135	124	75 - 241
Suspended Solids (mg/l)	17	35	18	31	25	0 - 105
Volatile Solids (mg/l)	51	61	57	52	55	25 - 104
Specific Conductance (micromhos/cm)	64	130	75	48	79	40 - 188
Sodium (mg/l)	-	-	-	-	-	
Sulfate (mg/l)	-	-	-	-	-	
Chloride (mg/l)	-	-	-	-	-	
Iron (mg/l)	-	-	-	-	-	
Manganese (mg/l)	-	-	-	-	-	
Total Hardness (mg/l $CaCO_3$)	23	37	25	35	30	14 - 110
Calcium Hardness (mg/l $CaCO_3$)	15.3	25.3	14.3	21.4	19.1	7.5 - 77
Oils & Grease (mg/l)	1.79	2.97	0.05	0.10	1.23	0.0 - 15.2

TABLE C-52
Summary of Baseflow Sampling
Station 6

PARAMETER	SPRING MEAN	SUMMER MEAN	FALL MEAN	WINTER MEAN	ANNUAL MEAN	ANNUAL RANGE
pH	6.4	6.8	6.3	6.8	6.6	5.9 - 7.1
Alkalinity (mg/l $CaCO_3$)	6	23	12	8	12	2 - 30
Temperature (°C)	14.7	22.8	14.3	6.4	14.6	4.5 - 25
D.O. (mg/l)	7.8	3.4	3.5	11.2	6.5	0.3 - 12.4
CO_2 (mg/l)	6.4	14	8.7	3.5	8.2	2 - 19
True Color (PCU)	47	126	144	83	98	5 - 200
Turbidity (JTU)	<80	<80	<80	<80	<80	-
Secchi Transparency (cm)	-	-	-	-	-	-
Total Coliform (per 100 ml)	21,333	21,433	38,900	41,633	30,825	1,100 -195,000
Fecal Coliform (per 100 ml)	1,248	2,588	292	788	1,229	0 - 13,000
Fecal Streptococci (per 100 ml)	740	1,262	177	745	731	0 - 5,800
B.O.D. (mg/l)	4.7	18.3	4.2	3.7	7.7	1.0 - 73.0
C.O.D. (mg/l)	18	28	25	22	23	5 - 48
Ammonia (mg/l N)	0.20	0.25	0.25	0.10	0.21	0.01- 0.64
Nitrite (mg/l N)	0	0	0	0	0	0
Nitrate (mg/l N)	0.34	1.53	1.53	0.62	1.02	0.20- 1.88
Total Kjeldahl (mg/l)	1.31	1.03	1.83	1.28	1.37	0.25- 2.65
Total Phosphorus (mg/l)	0.04	0.08	0.11	0.05	0.07	0.01- 0.31
Total Solids (mg/l)	124	108	105	96	108	63 - 297
Suspended Solids (mg/l)	44	16	10	9	20	0 - 212
Volatile Solids (mg/l)	52	41	45	35	41	11 - 133
Specific Conductance (micromhos/cm)	45	68	58	36	52	30 - 100
Sodium (mg/l)	-	-	-	-	-	
Sulfate (mg/l)	-	-	-	-	-	
Chloride (mg/l)	-	-	-	-	-	
Iron (mg/l)	-	-	-	-	-	
Manganese (mg/l)	-	-	-	-	-	
Total Hardness (mg/l $CaCO_3$)	16	21	20	17	19	11 - 29
Calcium Hardness (mg/l $CaCO_3$)	11.5	16.4	9.9	6.9	11.2	6.0 - 32
Oils & Grease (mg/l)	1.21	1.42	2.0	0.0	1.15	0.0 - 8.4

Table C-53
Summary of Baseflow Sampling
Station 7

PARAMETER	SPRING MEAN	SUMMER MEAN	FALL MEAN	WINTER MEAN	ANNUAL MEAN	ANNUAL RANGE
pH	6.5	6.8	6.7	6.6	6.6	6.3 - 7.1
Alkalinity (mg/l $CaCO_3$)	19	50	38	16	31	4 - 71
Temperature (°C)	16.6	24.6	15.3	6.9	15.9	5.0 - 26.5
D.O. (mg/l)	5.0	0.9	1.6	8.3	3.9	0.1 - 10.4
CO_2 (mg/l)	9.6	17.2	12.8	5.8	11.4	4 - 22
True Color (PCU)	68	107	108	100	95	20 - 145
Turbidity (JTU)	<80	<80	<80	<80	<80	-
Secchi Transparency (cm)	-	-	-	-	-	-
Total Coliform (per 100 ml)	31,733	104,917	10,187	25,167	43,001	220 -330,000
Fecal Coliform (per 100 ml)	2,492	3,098	268	265	1,531	0 - 9,300
Fecal Streptococci (per 100 ml)	1,672	488	82	377	655	0 - 8,800
B.O.D. (mg/l)	6.7	28.9	5.5	4.0	11.3	2.6 - 60
C.O.D. (mg/l)	20	37	19	24	25	5 - 48
Ammonia (mg/l N)	0.32	1.39	0.76	0.23	0.71	0.08- 4.67
Nitrite (mg/l N)	0.01	0.01	0.05	0.01	0.02	0.01- 0.03
Nitrate (mg/l N)	0.71	0.59	1.58	0.88	0.94	0.27- 2.57
Total Kjeldahl (mg/l)	1.98	3.7	2.94	1.38	2.60	0.7 - 6.8
Total Phosphorus (mg/l)	0.35	0.79	0.70	0.35	0.55	0.05- 0.96
Total Solids (mg/l)	158	160	148	132	150	87 - 240
Suspended Solids (mg/l)	39	28	23	45	34	2 - 90
Volatile Solids (mg/l)	48	72	58	48	57	12 - 120
Specific Conductance (micromhos/cm)	78	153	112	62	101	40 - 205
Sodium (mg/l)	-	-	-	-	-	
Sulfate (mg/l)	-	-	-	-	-	
Chloride (mg/l)	-	-	-	-	-	
Iron (mg/l)	-	-	-	-	-	
Manganese (mg/l)	-	-	-	-	-	
Total Hardness (mg/l $CaCO_3$)	24	43	30	23	30	20 - 64
Calcium Hardness (mg/l $CaCO_3$)	15.4	26.0	18.8	12.3	18.1	8.5 - 37
Oils & Grease (mg/l)	2.50	1.42	0.00	0.80	1.18	0.0 - 8.10

Table C-54
Summary of Baseflow Sampling
Station 8a

PARAMETER	SPRING MEAN	SUMMER MEAN	FALL MEAN	WINTER MEAN	ANNUAL MEAN	ANNUAL RANGE
pH	6.9	7.2	7.0	7.3	7.1	6.5 - 7.5
Alkalinity (mg/l $CaCO_3$)	59	77	86	71	73	48 - 101
Temperature (°C)	19.1	24.8	15.5	7.5	16.7	6.0 - 26.1
D.O. (mg/l)	4.2	3.9	5.9	9.8	5.9	1.8 - 12.0
CO_2 (mg/l)	10.2	10.3	11.3	6.2	9.5	5 - 13.1
True Color (PCU)	34	60	84	117	73	15 - 140
Turbidity (JTU)	<80	<80	<80	<80	<80	-
Secchi Transparency (cm)	-	-	-	-	-	-
Total Coliform (per 100 ml)	160,150	50,500	48,750	112,100	92,875	3,900 -630,000
Fecal Coliform (per 100 ml)	41,287	4,320	3,728	3,410	13,186	110 -216,000
Fecal Streptococci (per 100 ml)	9,805	577	988	2,878	3,425	40 - 48,000
B.O.D. (mg/l)	9.3	21.1	7.3	4.3	10.5	2.2 - 62.0
C.O.D. (mg/l)	10	35	23	21	22	4 - 62
Ammonia (mg/l N)	0.63	0.30	0.39	0.30	0.41	0.08- 2.87
Nitrite (mg/l N)	0.01	0.02	0.01	0.01	0.01	0 - 0.04
Nitrate (mg/l N)	0.36	0.38	1.38	0.78	0.72	0.14- 5.28
Total Kjeldahl (mg/l)	2.04	1.76	2.03	1.40	1.84	0.40- 4.34
Total Phosphorus (mg/l)	0.24	0.19	0.32	0.19	0.23	0.02- 0.64
Total Solids (mg/l)	138	165	194	220	179	114 - 283
Suspended Solids (mg/l)	22	17	17	52	27	0 - 95
Volatile Solids (mg/l)	51	55	76	98	70	25 - 158
Specific Conductance (micromhos/cm)	176	211	192	159	184	125 - 249
Sodium (mg/l)	-	-	-	-	-	
Sulfate (mg/l)	-	-	-	-	-	
Chloride (mg/l)	-	-	-	-	-	
Iron (mg/l)	-	-	-	-	-	
Manganese (mg/l)	-	-	-	-	-	
Total Hardness (mg/l $CaCO_3$)	36	63	66	64	57	30 - 114
Calcium Hardness (mg/l $CaCO_3$)	29.8	38.8	48.1	45.5	40.6	23 - 61
Oils & Grease (mg/l)	2.47	0.82	0.00	0.68	0.99	0 - 4.70

TABLE C-55
Summary of Baseflow Sampling
Station 9a

PARAMETER	SPRING MEAN	SUMMER MEAN	FALL MEAN	WINTER MEAN	ANNUAL MEAN	ANNUAL RANGE
pH	8.0	7.6	8.1	7.5	7.8	7.2 - 9.1
Alkalinity (mg/l $CaCO_3$)	47	59	59	61	56	41 - 72
Temperature (°C) See Appendix C	-	-	-	-	-	-
D.O. (mg/l) See Appendix C	-	-	-	-	-	-
CO_2 (mg/l)	0.9	5.3	4.0	3.0	3.4	0 - 8
True Color (PCU)	13	47	52	67	45	5 - 90
Turbidity (JTU)	<80	<80	<80	<80	<80	-
Secchi Transparency (cm)	55.2	44.7	58.8	57.6	54.1	28 - 84.5
Total Coliform (per 100 ml)	8,400	43,033	49,433	366,500	116,842	900 -760,000
Fecal Coliform (per 100 ml)	277	2,210	7,037	3,277	3,200	81 - 19,900
Fecal Streptococci (per 100 ml)	417	563	223	2,933	1,112	0 - 16,600
B.O.D. (mg/l)	4.9	6.3	4.4	3.9	4.9	2.8 - 6.9
C.O.D. (mg/l)	25	27	21	20	23	8 - 41
Ammonia (mg/l N)	0.18	0.13	0.20	0.10	0.16	0.07- 0.36
Nitrite (mg/l N)	0	0.01	0	0.01	0	0 - 0.02
Nitrate (mg/l N)	0.33	0.24	0.34	0.47	0.34	0.20- 0.6
Total Kjeldahl (mg/l)	1.08	1.97	2.41	1.00	1.76	0.38- 2.64
Total Phosphorus (mg/l)	0.06	0.09	0.16	0.1	0.10	0 - 0.22
Total Solids (mg/l)	150	300	143	145	184	108 - 554
Suspended Solids (mg/l)	27	202	17	16	65	0 - 425
Volatile Solids (mg/l)	50	72	61	59	61	23 - 82
Specific Conductance (micromhos/cm)	182	177	156	132	161	125 - 230
Sodium (mg/l)	-	-	-	-	-	
Sulfate (mg/l)	-	-	-	-	-	
Chloride (mg/l)	-	-	-	-	-	
Iron (mg/l)	-	-	-	-	-	
Manganese (mg/l)	-	-	-	-	-	
Total Hardness (mg/l $CaCO_3$)	64	44	50	49	52	40 - 97
Calcium Hardness (mg/l $CaCO_3$)	35.7	34.7	33.3	34.3	34.5	22.5 - 42.5
Oils & Grease (mg/l)	1.53	12.63	0.90	0.77	3.96	0.0 - 37.1

TABLE C-56
Summary of Baseflow Sampling
Station 9b

PARAMETER	SPRING MEAN	SUMMER MEAN	FALL MEAN	WINTER MEAN	ANNUAL MEAN	ANNUAL RANGE
pH	8.1	8.1	8.0	7.1	7.7	6.8 - 8.6
Alkalinity (mg/1 $CaCO_3$)	47	87	63	59	64	42 - 127
Temperature (°C) See Appendix C	-	-	-	-	-	-
D.O. (mg/1) See Appendix C	-	-	-	-	-	-
CO_2 (mg/1)	2.5	3.7	1.7	3.7	2.9	0 - 7
True Color (PCU)	14	53	38	28	36	5 - 80
Turbidity (JTU)	<80	<80	<80	<80	<80	-
Secchi Transparency (cm)	64.0	42.4	65.9	89.3	65.4	25.4 - 96.4
Total Coliform (per 100 ml)	54,567	5,053	31,933	106,067	49,405	500 -307,000
Fecal Coliform (per 100 ml)	560	233	553	20	342	0 - 1,470
Fecal Streptococci (per 100 ml)	903	10	531	7	243	0 - 2,650
B.O.D. (mg/1)	5.0	8.2	4.8	4.1	5.5	3.3 - 11.0
C.O.D. (mg/1)	26	38	24	21	27	13 - 63
Ammonia (mg/1 N)	0.24	0.22	0.29	0.10	C.22	0.09- 0.39
Nitrite (mg/1 N)	0	0	0.01	0	0	0 - 0.04
Nitrate (mg/1 N)	0.47	0.45	1.05	0.50	0.62	0.20- 2.56
Total Kjeldahl (mg/1)	1.65	2.57	2.23	1.65	2.06	0.8 - 4.3
Total Phosphorus (mg/1)	0.07	0.09	0.10	0.06	0.08	0.04- 0.18
Total Solids (mg/1)	124	205	145	122	149	103 - 260
Suspended Solids (mg/1)	23	55	13	17	27	0 - 105
Volatile Solids (mg/1)	43	77	58	47	58	13 - 100
Specific Conductance (micromhos/cm)	149	252	183	129	172	126 - 346
Sodium (mg/1)	-	-	-	-	-	
Sulfate (mg/1)	-	-	-	-	-	
Chloride (mg/1)	-	-	-	-	-	
Iron (mg/1)	-	-	-	-	-	
Manganese (mg/1)	-	-	-	-	-	
Total Hardness (mg/1 CaCO3)	47	82	61	49	60	42 - 116
Calcium Hardness (mg/1 $CaCO_3$)	37.0	70.7	42.9	33.3	45.9	26.8 - 104
Oils & Grease (mg/1)	0.97	1.37	0.00	0.07	0.6	0.0 - 1.9

TABLE C-57
Summary of Baseflow Sampling
Station 10a

PARAMETER	SPRING MEAN	SUMMER MEAN	FALL MEAN	WINTER MEAN	ANNUAL MEAN	ANNUAL RANGE
pH	8.1	8.6	8.6	7.7	8.3	7.1 - 9.3
Alkalinity (mg/l $CaCO_3$)	77	61	83	80	75	50 - 90
Temperature (°C) See Appendix C	-	-	-	-	-	-
D.O. (mg/l) See Appendix C	-	-	-	-	-	-
CO_2 (mg/l)	2.3	1.3	2.0	2.7	2.1	0 - 5
True Color (PCU)	20	35	20	45	30	10 - 60
Turbidity (JTU)	<80	<80	<80	<80	<80	-
Secchi Transparency (cm)	61.8	73.1	71.3	58.4	66.1	40.6 - 79.5
Total Coliform (per 100 ml)	3,277	190	8,833	9,900	5,550	120 -22,300
Fecal Coliform (per 100 ml)	200	47	10	13	68	0 - 270
Fecal Streptococci (per 100 ml)	30	0	8	33	22	0 - 90
B.O.D. (mg/l)	5.0	6.6	3.2	4.6	4.9	1.6 - 7.2
C.O.D. (mg/l)	20	24	29	26	25	8 - 34
Ammonia (mg/l N)	0.20	0.26	0.32	0.10	0.23	0.07- 0.59
Nitrite (mg/l N)	0	0	0	0	0	0 - 0.01
Nitrate (mg/l N)	0.36	0.24	0.15	1.93	0.67	0.05- 5.2
Total Kjeldahl (mg/l)	1.43	1.57	1.55	1.45	1.50	0.5 - 1.86
Total Phosphorus (mg/l)	0.06	0.08	0.10	0.1	0.09	0.01- 0.24
Total Solids (mg/l)	219	193	112	217	213	170 - 267
Suspended Solids (mg/l)	16	27	2	11	14	0 - 58
Volatile Solids (mg/l)	62	85	61	68	69	35 - 118
Specific Conductance (micromhos/cm)	304	302	325	223	288	193 - 330
Sodium (mg/l)	-	-	-	-	-	
Sulfate (mg/l)	-	-	-	-	-	
Chloride (mg/l)	-	-	-	-	-	
Iron (mg/l)	-	-	-	-	-	
Manganese (mg/l)	-	-	-	-	-	
Total Hardness (mg/l CaCO3)	98	75	103	91	92	67 - 111
Calcium Hardness (mg/l $CaCO_3$)	66.3	67.3	61.0	56.3	62.8	37.5 - 82
Oils & Grease (mg/l)	2.17	0.4	0.00	0.4	0.74	0.0 - 6.20

TABLE C-58
Summary of Baseflow Sampling
Station 10b

PARAMETER	SPRING MEAN	SUMMER MEAN	FALL MEAN	WINTER MEAN	ANNUAL MEAN	ANNUAL RANGE
pH	7.9	7.5	7.9	7.4	7.7	6.9 - 8.6
Alkalinity (mg/1 $CaCO_3$)	72	69	83	76	75	56 - 90
Temperature (°C) See Appendix C	-	-	-	-	-	
D.O. (mg/1) See Appendix C	-	-	-	-	-	
CO_2 (mg/1)	2.9	3.7	2.0	4.3	3.2	0 - 8
True Color (PCU)	28	43	23	50	36	5 - 80
Turbidity (JTU)	<80	<80	<80	<80	<80	-
Secchi Transparency (cm)	49.6	71.6	62.5	52.9	59.2	22.9 - 77.5
Total Coliform (per 100 ml)	7,173	333	53,867	8,103	17,369	100 -158,000
Fecal Coliform (per 100 ml)	90	59	93	3	62	0 - 160
Fecal Streptococci (per 100 ml)	13	0	37	7	14	0 - 110
B.O.D. (mg/1)	5.4	4.9	3.5	3.7	4.4	1.0 - 7.6
C.O.D. (mg/1)	17	26	29	27	25	9 - 43
Ammonia (mg/1 N)	0.15	0.09	0.22	0.10	0.15	0.05- 0.51
Nitrite (mg/1 N)	0	0	0	0	0	0 - 0.01
Nitrate (mg/1 N)	0.34	0.63	1.28	2.67	1.23	0.18- 1.3
Total Kjeldahl (mg/1)	1.36	1.30	1.94	1.60	1.55	0.7 - 2.09
Total Phosphorus (mg/1)	0.06	0.07	0.08	0.08	0.07	0.01- 0.17
Total Solids (mg/1)	199	190	245	221	214	166 - 260
Suspended Solids (mg/1)	15	18	22	30	21	0 - 37
Volatile Solids (mg/1)	59	62	67	74	66	37 - 84
Specific Conductance (micromhos/cm)	273	316	362	236	291	216 - 400
Sodium (mg/1)	-	-	-	-	-	
Sulfate (mg/1)	-	-	-	-	-	
Chloride (mg/1)	-	-	-	-	-	
Iron (mg/1)	-	-	-	-	-	
Manganese (mg/1)	-	-	-	-	-	
Total Hardness (mg/1 CaCO3)	87	83	101	87	90	80 - 106
Calcium Hardness (mg/1 $CaCO_3$)	59.3	69.7	72.2	52.0	63.3	52 - 79
Oils & Grease (mg/1)	1.33	0.33	2.1	0.5	1.07	0.0 - 4.4

TABLE C- 59
Summary of Baseflow Sampling
Station 10c

PARAMETER	SPRING MEAN	SUMMER MEAN	FALL MEAN	WINTER MEAN	ANNUAL MEAN	ANNUAL RANGE
pH	8.3	7.6	7.7	7.5	7.8	7.3 - 9.2
Alkalinity (mg/l $CaCO_3$)	82	80	88	72	81	53 - 121
Temperature (°C) See Appendix C	-	-	-	-	-	-
D.O. (mg/l) See Appendix C	-	-	-	-	-	-
CO_2 (mg/l)	2.0	3.8	3.3	3.0	3.0	0 - 5
True Color (PCU)	18	30	42	60	38	5 - 80
Turbidity (JTU)	<80	<80	<80	<80	<80	-
Secchi Transparency (cm)	60.1	58.7	49.3	49.9	54.5	27.9 - 79.4
Total Coliform (per 100 ml)	6,000	979	8,733	5,067	5,195	110 -13,300
Fecal Coliform (per 100 ml)	173	96	297	140	176	0 - 620
Fecal Streptococci (per 100 ml)	17	0	47	27	21	0 - 130
B.O.D. (mg/l)	4.1	3.3	1.5	3.8	3.2	0.6 - 5.9
C.O.D. (mg/l)	17	17	27	28	22	7 - 34
Ammonia (mg/l N)	0.15	0.07	0.24	0.10	0.15	0.06- 0.37
Nitrite (mg/l N)	0	0	0.01	0	0.01	0 - 0.03
Nitrate (mg/l N)	0.45	0.41	0.42	1.2	0.62	0.13- 2.6
Total Kjeldahl (mg/l)	1.21	1.15	1.61	1.25	1.31	0.3 - 2.00
Total Phosphorus (mg/l)	0.06	0.04	0.09	0.07	0.07	0 - 0.14
Total Solids (mg/l)	257	242	296	260	264	205 - 333
Suspended Solids (mg/l)	28	17	34	24	26	4 - 50
Volatile Solids (mg/l)	63	69	72	76	70	47 - 98
Specific Conductance (micromhos/cm)	391	410	392	272	364	250 - 507
Sodium (mg/l)	-	-	-	-	-	
Sulfate (mg/l)	-	-	-	-	-	
Chloride (mg/l)	-	-	-	-	-	
Iron (mg/l)	-	-	-	-	-	
Manganese (mg/l)	-	-	-	-	-	
Total Hardness (mg/l $CaCO_3$)	104	108	106	89	102	81 - 126
Calcium Hardness (mg/l $CaCO_3$)	68.7	89.7	62.6	55.0	68.9	32.8 - 106
Oils & Grease (mg/l)	1.70	0.00	0.47	0.70	0.72	0.0 - 5.0

TABLE C-60
Summary of Stormwater Quality
Station 1

SELECTED PARAMETERS*	May 14-15, 1974	July 25-26, 1974	Dec. 6-7, 1974	Jan. 10-11, 1975	Feb. 22-23, 1975	Mar. 9-10, 1975	All Events
D.O. (mg/1)	-	-	-	-	-	-	-
Total Coliform (per 100 ml in millions)	-	-	0.023/2.010 0.585	-	0.001/0.016 0.006	-	0.001/2.010 0.314
Fecal Coliform (per 100 ml in millions)	-	-	0.001/0.007 0.002	-	< 0.001/0.004 0.001	-	< 0.001/0.007 0.002
Fecal Streptococci (per 100 ml in millions)	-	-	< 0.001/0.004 0.002	-	< 0.001/0.003 0.001	-	< 0.001/0.004 0.001
B.O.D. (mg/1)	-	-	6.6/37.0 11.7	-	1.8/4.0 3.1	-	1.8/37.0 7.4
C.O.D. (mg/1)	-	-	26.0/51.0 36.8	-	22.0/39.0 29.9	-	22.0/51/0 33.4
Ammonia (mg/1 N)	-	-	0.10/0.20 0.13	-	0.10/0.10 0.10	-	0.10/0.20 0.11
Nitrite (mg/1 N)	-	-	0.0/0.0 0.0	-	0.0/0.0 0.0	-	0.0/0.0 0.0
Nitrate (mg/1 N)	-	-	2.3/9.2 5.7	-	0.2/1.3 0.5	-	0.2/9.2 3.8
Total Kjeldahl (mg/1)	-	-	0.20/0.80 0.46	-	1.6/2.2 1.80	-	0.20/2.20 1.14
Total Phosphorus (mg/1)	-	-	0.01/0.04 0.03	-	0.02/0.04 0.02	-	0.01/0.04 0.03
Total Solids (mg/1)	-	-	84/115 99	-	95/244 169	-	84/244 134
Suspended Solids (mg/1)	-	-	18/70 44	-	3/132 79	-	3/132 62
Volatile Solids (mg/1)	-	-	1/30 18	-	32/81 53	-	1/81 35
Calcium Hardness (mg/1 $CaCO_3$)	-	-	6.8/13.0 8.5	-	5.0/7.8 6.1	-	5.0/13.0 7.3
Oils & Grease (mg/1)	-	-	0.0/18.0 4.5	-	0.3/9.3 2.9	-	0.0/18.0 3.7

* Minimum/Maximum
Mean

TABLE C-61
Summary of Stormwater Quality
Station 2

SELECTED PARAMETERS*	May 14-15, 1974	July 25-26, 1974	Dec. 6-7, 1974	Jan. 10-11, 1975	Feb. 22-23, 1975	Mar. 9-10, 1975	All Events
D.O. (mg/1)	-	-	-	-	-	-	-
Total Coliform (per 100 ml in millions)	-	0.081/4.860 2.393	0.018/8.600 3.213	-	0.348/0.510 0.429	-	-
Fecal Coliform (per 100 ml in millions)	< 0.001/0.251 0.076	0.003/0.250 0.115	< 0.001/0.006 0.002	-	< 0.001/0.028 0.012	-	< 0.001/0.250 0.048
Fecal Streptococci (per 100 ml in millions)	-	0.001/0.144 0.093	< 0.001/0.011 0.005	-	< 0.001/0.048 0.021	-	< 0.001/0.144 0.040
B.O.D. (mg/1)	-	3.0/12.0 6.9	5.6/8.1 7.0	-	1.6/8.9 6.2	-	1.6/12.0 6.7
C.O.D. (mg/1)	4.0/57.0 38.0	4.0/39.0 23.7	17.0/51.0 35.3	-	28.0/49.0 37.7	-	4.0/57.0 33.3
Ammonia (mg/1 N)	-	< 0.04/0.09 0.05	0.10/0.20 0.17	-	0.10/0.20 0.13	-	< 0.04/0.20 0.12
Nitrite (mg/1 N)	-	0.00/0.03 0.01	0.01/0.03 0.14	-	0.00/0.03 0.01	-	0.00/0.03 0.01
Nitrate (mg/1 N)	-	0.27/0.77 0.53	0.8/11.0 3.8	-	0.18/0.70 0.34	-	0.18/11.0 1.23
Total Kjeldahl (mg/1)	-	0.6/4.6 3.0	0.3/1.4 0.9	-	1.1/3.6 2.6	-	0.1/4.6 2.2
Total Phosphorus (mg/1)	-	0.02/0.23 0.11	0.12/0.58 0.24	-	0.15/0.33 0.19	-	0.02/0.58 0.18
Total Solids (mg/1)	187/3770 1336	143/3776 1162	98/340 182	-	157/1415 787	-	98/3776 782
Suspended Solids (mg/1)	90/3552 1210	5/3522 1560	4/222 85	-	8/1055 594	-	4/3552 836
Volatile Solids (mg/1)	-	40/972 217	0/51 33	-	50/164 93	-	0/972 115
Calcium Hardness (mg/1 $CaCO_3$)	-	5.8/24.0 10.1	15.0/22.0 18.8	-	18.0/24.0 21.3	-	5.8/24.0 16.7
Oils & Grease (mg/1)	-	-	0.0/18.0 4.5	-	0.3/9.3 2.9	-	0.0/18.0 3.7

* Minimum/Maximum
Mean

TABLE C-62
Summary of Stormwater Quality
Station 3

SELECTED PARAMETERS*	May 14-15, 1974	July 25-26, 1974	Dec. 6-7, 1974	Jan. 10-11, 1975	Feb. 22-23, 1975	Mar. 9-10, 1975	All Events
D.O. (mg/1)	-	-	-	-	-	-	-
Total Coliform (per 100 ml in millions)	-	0.005/6.900 2.523	-	-	-	-	0.005/6.900 2.523
Fecal Coliform (per 100 ml in millions)	0.001/0.021 0.006	<0.001/0.061 0.038	-	-	-	-	<0.001/0.061 0.024
Fecal Streptococci (per 100 ml in millions)	-	<0.001/0.087 0.031	-	-	-	-	<0.001/0.087 0.031
B.O.D. (mg/1)	-	5.2/26.0 9.2	-	-	-	-	5.2/26.0 9.2
C.O.D. (mg/1)	17.0/33.0 25.0	7.0/34.0 23.2	-	-	-	-	7.0/34.0 24.2
Ammonia (mg/1 N)	-	<0.04/0.73 0.25	-	-	-	-	<0.04/0.73 0.25
Nitrite (mg/1 N)	-	0.00/0.01 <0.01	-	-	-	-	0.00/0.01 <0.01
Nitrate (mg/1 N)	-	0.25/0.81 0.61	-	-	-	-	0.25/0.81 0.61
Total Kjeldahl (mg/1)	-	0.9/3.6 2.2	-	-	-	-	0.9/3.6 2.2
Total Phosphorus (mg/1)	-	0.06/0.17 0.12	-	-	-	-	0.06/0.17 0.12
Total Solids (mg/1)	162/353 213	164/672 271	-	-	-	-	162/672 244
Suspended Solids (mg/1)	89/258 133	43/665 239	-	-	-	-	43/665 190
Volatile Solids (mg/1)	-	21.0/77.0 46.6	-	-	-	-	21.0/77.0 46.6
Calcium Hardness (mg/1 $CaCO_3$)	-	8.2/22.0 13.3	-	-	-	-	8.2/22.0 13.3
Oils & Grease (mg/1)	1.1/4.2 2.9	0.0/7.8 2.8					0.0/7.8 2.9

* Minimum/Maximum
Mean

TABLE C-63
Summary of Stormwater Quality
Station 4

SELECTED PARAMETERS*	May 14-15, 1974	July 25-26, 1974	Dec. 6-7, 1974	Jan. 10-11, 1975	Feb. 22-23, 1975	Mar. 9-10, 1975	All Events
D.O. (mg/l)	-	-	-	-	-	-	-
Total Coliform (per 100 ml in millions)	-	0.113/6.100 2.807	0.027/4.150 0.796	-	0.001/0.430 0.139	-	0.001/6.100 1.123
Fecal Coliform (per 100 ml in millions)	0.002/0.054 0.026	0.438/0.025 0.283	0.001/0.052 0.013	-	<0.001/0.007 0.003	-	<0.001/0.438 0.075
Fecal Streptococci (per 100 ml in millions)	-	0.015/0.181 0.099	0.001/0.014 0.005	-	<0.001/0.012 0.004	-	<0.001/0.181 0.031
B.O.D. (mg/l)	-	6.5/25.0 11.5	6.4/41.0 16.3	-	3.3/6.6 5.2	-	3.3/41.0 11.0
C.O.D. (mg/l)	39.0/70.0 51.0	18.0/57.0 37.7	18.0/40.0 29.4	-	22.0/36.0 31.5	-	18.0/70.0 36.4
Ammonia (mg/l N)	-	0.15/0.78 0.42	0.10/0.20 0.12	-	0.50/2.60 1.8	-	0.10/2.60 0.68
Nitrite (mg/l N)	-	0.01/0.08 0.03	0.00/0.03 0.02	-	0.00/0.002 0.01	-	0.00/0.08 0.02
Nitrate (mg/l N)	-	0.6/1.1 0.9	1.2/7.2 4.3	-	0.4/0.7 0.5	-	0.4/7.2 1.9
Total Kjeldahl (mg/l)	-	1.8/4.5 3.2	0.7/1.6 1.2	-	2.5/4.3 3.7	-	0.7/4.5 2.7
Total Phosphorus (mg/l)	-	0.07/0.32 0.19	0.27/0.40 0.30	-	0.03/0.27 0.14	-	0.03/0.32 0.21
Total Solids (mg/l)	191/975 540	176/3177 929	1091/539 224	-	220/535 303	-	109/3177 496
Suspended Solids (mg/l)	16/854 413	11/2788 831	33/320 114	-	0/265 93	-	11/2788 359
Volatile Solids (mg/l)	-	36/210 93	22/68 43	-	38/91 64	-	22/210 67
Calcium Hardness (mg/l $CaCO_3$)	-	12.0/68.0 31.6	24.0/37.0 29.6	-	31.0/88.0 67.3	-	12.0/88.0 42.8
Oils & Grease (mg/l)	2.6/4.1 3.5	0.0/4.1 1.4	0.0/1.0 0.1	-	0.0/8.8 3.5	-	0.0/8.8 2.1

* Minimum/Maximum
Mean

TABLE C-64
Summary of Stormwater Quality
Station 5

SELECTED PARAMETERS*	May 14-15, 1974	July 25-26, 1974	Dec. 10-11, 1974	Jan. 10-11, 1975	Feb. 22-23, 1975	Mar. 9-10, 1975	All Events
D.O. (mg/l)	-	-	-	-	-	-	-
Total Coliform (per 100 ml in millions)	-	0.003/0.840 0.333	0.031/0.203 0.063	-	0.002/0.049 0.022	-	0.002/0.840 0.139
Fecal Coliform (per 100 ml in millions)	<0.001/0.043 0.009	0.001/0.048 0.0032	<0.001/0.001 <0.001	-	<0.001/0.004 0.001	-	<0.001/0.048 0.011
Fecal Streptococci (per 100 ml in millions)	-	<0.001/0.036 0.010	<0.001/0.001 <0.001	-	<0.001/0.003 0.001	-	<0.001/0.036 0.004
B.O.D. (mg/l)	-	3.9/14.0 6.3	6.0/7.7 6.8	-	1.5/5.5 3.1	-	1.5/14.0 5.5
C.O.D. (mg/l)	2.1/32.0 23.9	17.0/42.0 32.3	15.0/50.0 30.6	-	27.0/39.0 34.2	-	2.1/50.1 30.4
Ammonia (mg/l N)	-	<0.04/0.22 0.11	0.10/0.20 0.15	-	0.10/0.10 0.10	-	<0.041/0.22 0.12
Nitrite (mg/l N)	-	0.00/0.02 0.01	0.00	-	0.00	-	0.00/0.02 0.01
Nitrate (mg/l N)	0.6	0.38/0.84 0.63	1.7/9.2 5.7		0.3/1.0 0.15		0.3/9.2 2.2
Total Kjeldahl (mg/l)	-	1.91/3.6 2.3	0.30/0.80 0.54	-		-	
Total Phosphorus (mg/l)				-		-	
Total Solids (mg/l)	116/338 175	124/690 262	80/116 95	-	120/195 149	-	80/690 170
Suspended Solids (mg/l)	14/258 94	5/606 180	0/52 28	-	9/73 33	-	0/606 83
Volatile Solids (mg/l)				-		-	
Calcium Hardness (mg/l $CaCO_3$)	-	17.0/32.0 22.8	8.2/12.0 9.9	-	7.8/13.0 10.5	-	7.8/12.0 14.4
Oils & Grease (mg/l)	2.4/3.3 2.8	0.0/6.3 1.9	0/2.2 0.3	-	0.0/7.9 2.8	-	0.0/7.9 2.0

* Minimum/Maximum
Mean

TABLE C-65
Summary of Stormwater Quality
Station 7

SELECTED PARAMETERS*	May 14-15, 1974	July 25-26, 1974	Dec. 6-7, 1974	Jan. 10-11, 1975	Feb. 22-23, 1975	Mar. 9-10, 1975	All Events
D.O. (mg/l)	-	-	-	-	-	-	-
Total Coliform (per 100 ml in millions)	-	0.023/0.860 0.531	-	0.071/1.270 0.830	-	0.008/0.092 0.040	0.008/1.270 0.467
Fecal Coliform (per 100 ml in millions)	0.002/0.1 0.046	0.001/0.054 0.022	-	<0.001/0.009 0.005	-	<0.001/0.043 0.001	<0.001/0.018 0.107
Fecal Streptococci (per 100 ml in millions)	-	<0.001/0.034 0.010	-	<0.001/0.016 0.008	-	<0.001/0.001 <0.001	<0.001/0.034 0.006
B.O.D. (mg/l)	-	5.0/13.0 7.5	-	4.0/6.0 4.9	-	5.0/8.0 6.6	4.0/13.0 7.1
C.O.D. (mg/l)	33.0/49.0 40.3	14.0/42.0 35.1	-	22.0/37.0 30.6	-	28.0/46.0 40.1	14.0/49.0 34.9
Ammonia (mg/l N)	-	0.06/0.93 0.35	-	0.20/0.40 0.24	-	0.20/0.70 0.30	0.06/0.93 0.30
Nitrite (mg/l N)	-	0/0.02 0.01	-	0/0.01 0.00	-	0.01/0.01 0.01	0/0.02 0.01
Nitrate (mg/l N)	-	0.45/0.74 0.60	-	0.5/1.5 0.84	-	0.7/1.6 1.1	0.45/1.60 0.83
Total Kjeldahl (mg/l)	-	1.6/5.0 2.4	-	1.3/2.8 2.1	-	1.3/2.2 1.83	1.3/5.0 2.1
Total Phosphorus (mg/l)	-	0.09/1.30 0.74	-	0.19/0.69 0.42	-	0.38/0.64 0.54	0.09/1.30 0.56
Total Solids (mg/l)	205/398 258	148/248 201	-	120/378 221	-	122/195 141	120/398 203
Suspended Solids (mg/l)	99/317 164	9/196 125	-	18/253 115	-	5/64 27	5/317 106
Volatile Solids (mg/l)	-	25.0/75.0 52.1	-	33.0/56.0 45.6	-	45.0/67.0 57.3	25.0/75.0 51.7
Calcium Hardness (mg/l $CaCO_3$)	-	14.0/37.0 25.8	-	7.0/27.0 14.0	-	14.0/23.0 16.4	14.0/37.0 18.7
Oils & Grease (mg/l)	1.7/3.5 2.6	0/8.9 1.7	-	0/2.1 0.4	-	0/0.2 0.02	0/8.9 1.2

* Minimum/Maximum
Mean

TABLE C-66
Summary of Stormwater Quality
Station 8a

SELECTED PARAMETERS*	May 14-15, 1974	July 25-26, 1974	Dec. 6-7, 1974	Jan. 10-11, 1975	Feb. 22-23, 1975	Mar. 9-10, 1975	All Events
D.O. (mg/l)	-	-	-	-	-	-	-
Total Coliform (per 100 ml in millions)	-	0.013/8.900 5.339	-	0.093/5.590 3.438	-	0.014/0.880 1.490	0.013/5.590 3.219
Fecal Coliform (per 100 ml in millions)	-	0.006/0.330 0.174	-	0.005/0.071 0.021	-	< 0.001/0.073 0.029	< 0.001/0.073 0.025
Fecal Streptococci (per 100 ml in millions)	-	< 0.001/0.203 0.120	-	0.002/0.023 0.012	-	< 0.001/0.029 0.019	< 0.001/0.203 0.050
B.O.D. (mg/l)	-	7.3/19.0 12.3	-	4.7/5.8 5.1	-	2.0/9.3 6.6	2.0/19.0 8.0
C.O.D. (mg/l)	22.0/88.0 43.3	19.0/60.0 42.5	-	12.0/36.0 30.4	-	22.0/42.0 35.9	12.0/60.0 36.2
Ammonia (mg/l N)	-	< 0.04/0.39 0.09	-	0.20/0.30 0.21	-	0.20/0.50 0.34	< 0.04/60.0 0.22
Nitrite (mg/l N)	0.01/0.03 0.01	0.01/0.02 0.01	-	0.00/0.01 0.01	-	0.01/0.01 0.01	0.00/0.02 0.01
Nitrate (mg/l N)	-	0.34/1.20 0.95	-	0.50/1.20 0.68	-	0.30/1.10 0.73	0.30/1.20 0.79
Total Kjeldahl (mg/l)	-	1.3/5.0 2.3	-	1.7/3.9 2.2	-	1.3/2.3 2.0	1.3/5.0 2.2
Total Phosphorus (mg/l)	-	0.01/0.31 0.21	-	0.24/0.47 0.33	-	0.12/1.44 0.39	0.01/1.44 0.31
Total Solids (mg/l)	206/791 474	133/771 297	-	171/626 313	-	174/382 223	133/791 326
Suspended Solids (mg/l)	104/698 383	19/737 234	-	0/509 188	-	23/281 92	0/737 224
Volatile Solids (mg/l)	-	22/52 36	-	46/93 66	-	48/78 67	22/93 56
Calcium Hardness (mg/l $CaCO_3$)	-	12.0/37.0 19.1	-	20.0/61.0 28.8	-	23.0/44.0 30.9	12.0/61.0 26.3
Oils & Grease (mg/l)	4.4/6.4 5.2	0.0/5.0 1.0	-	0.0/2.1 0.8	-	0.0/0.0 0.0	0.0/6.4 1.8

* Minimum/Maximum
Mean

Table C-67
Summary of Storm Water Quality
Station 8b

SELECTED PARAMETERS*	May 14-15, 1974	July 25-26, 1974	Dec. 6-7, 1974	Jan. 10-11, 1975	Feb. 22-23, 1975	Mar. 9-10, 1975	All Events
D.O. (mg/l)	-	-	-	-	-	-	-
Total Coliform (per 100 ml in millions)	-	0.013/8.900 5.339	-	0.093/5.59 5.590	-	0.013/0.002 1.108	0.013/8.900 2.941
Fecal Coliform (per 100 ml in millions)	0.113/0.167 0.150	0.005/0.330 0.174	-	0.005/0.021 0.014	-	< 0.001/0.049 0.018	< 0.001/0.330 0.089
Fecal Streptococci (per 100 ml in millions)	-	0.001/0.203 0.120	-	0.001/0.061 0.025	-	< 0.001/0.040 0.017	< 0.001/0.203 0.054
B.O.D. (mg/l)	-	-	-	4.1/9.5 7.7	-	3.0/>11.0 5.5	3.0/>11.0 6.6
C.O.D. (mg/l)	-	-	-	-	-	-	-
Ammonia (mg/l N)	-	-	-	-	-	-	-
Nitrite (mg/l N)	-	-	-	-	-	-	-
Nitrate (mg/l N)	-	-	-	-	-	-	-
Total Kjeldahl (mg/l)	-	-	-	-	-	-	-
Total Phosphorus (mg/l)	-	-	-	-	-	-	-
Total Solids (mg/l)	-	-	-	-	-	-	-
Suspended Solids (mg/l)	-	-	-	-	-	-	-
Volatile Solids (mg/l)	-	-	-	-	-	-	-
Calcium Hardness (mg/l $CaCO_3$)	-	-	-	-	-	-	-
Oils & Grease (mg/l)	-	-	-	-	-	-	-

* Minimum/Maximum
Mean

MAJOR INDUSTRIES DISCHARGING TO SURFACE WATERS

The major industries which discharge to surface waters are within the Arkansas River Basin. They are concentrated in the Arkansas River System and the Brumps and Lower Caney (I and II) sub-basins.

A. The Arkansas System. There are a number of industries which are located in either the Arkansas or Deep Bayou river systems, but which discharge into the Arkansas River:

Valmac Industries - Waldron Processing Plant
International Paper Company
St. Louis Southwestern Railway Company (Cotton Belt)
Weyerhaeuser Pulp and Paper
Allied Chemical
Pine Bluff Arsenal - U.S. Department of the Army

As their discharges do not influence the monitored stations, a description of their processes and effluents is omitted. The majority of these industries are permitted by the Arkansas Department of Pollution Control and Ecology and detailed process description and the results of effluent monitoring can be obtained from this agency.

B. The Caney Bayou System. There are four industries in the Lower Caney watersheds which discharge into Caney Bayou.

1. Weyerhaeuser Company - Dierks Division. The plant wastes are discharged into a 1.4-acre oxidation pond shared with the Viking Bag Company. Effluent from the pond discharges into Caney Bayou.

The U.S. Environmental Protection Agency tested composite samples of the pond influent and effluent in May, 1973. The results were reported by the Arkansas Department of Pollution Control and Ecology (1974a): influent included an average of 244 mg/l BOD, 564 mg/l COD, 236 mg/l suspended solds; effluent had an average flow of 0.0647 MGD with 27 mg/l BOD (88 per cent reduction), 78 mg/l suspended solids (67 per cent reduction) and 112 mg/l dissolved solids (59 per cent reduction).

2. Viking Bag Company. Sanitary and industrial wastes from the plant are discharged to a 1.4-acre oxidation pond which is shared with the Weyerhaeuser Dierks Multiwall Bag Plant.

3. Dixie Wood Preserving Company. Wastes are collected by a small oxidation pond which discharges into Caney Bayou. Currently, data on the quality and quantity of effluent are not available.

4. Pine Bluff Arsenal. Operations at the Pyrotechnic Munitions Manufacturing Area generate waste waters containing some organic dyes, chlorates, carbonates and chlorides. A portion of this area drains east to the Arkansas River, while the remainder drains west to Caney Bayou (Arkansas Department of Pollution Control and Ecology, 1974a).

C. The Brumps Bayou System. Each of the discharging industries are located in the Brumps sub-basin and discharge into Brumps Bayou.

1. Valmac Industries, Incorporated. The two main sources of process waste water from the plant are the offal and feather flow-away lines. Each line is equipped with a vibrating screen through which waste water flows before combining into a plant sewer line connected to the Harding Sewer System. Sanitary sewage from the plant is discharged to a separate line connected to the city sanitary sewer. All wastes are collected at the Spruce Street pumping station. During moderate to heavy rains, wastes collected at this pump station frequently by-pass the system and discharge into Brumps Bayou.

The Arkansas Department of Pollution Control and Ecology (1974a) monitored waste water flow and took 24-hour composite samples of the process effluent below the vibrating screens on four days. Process effluent flow averaged 0.698 MGD with 387 mg/l BOD, 658 mg/l COD, 573 mg/l total solids and 212 mg/l suspended solids.

2. W.S. Fox and Sons, Inc. In compliance with an NPDES permit, effluent has been monitored monthly. During the first nine months of 1974, BOD averaged 206 mg/l; total suspended solids, 247 mg/l.

3. Arkansas Oak Flooring Company. Arkansas Oak Flooring Company discharges industrial wastes to Brumps Bayou. NPDES permit monitoring for the first six months of 1974 indicated 26.2 mg/l BOD and 57.4 mg/l total suspended solids.

Table C-68

Industries of the Pine Bluff, Arkansas Area*

A. Arkansas Basin

ARKANSAS RIVER SYSTEM

NO. OF ** EMPLOYEES	INDUSTRY	SIC NO.	DRAINAGE SUB-BASIN	MUNICIPAL SEWER SYSTEM SERVICE	DISCHARGE RECEIVING WATER BODY	PRODUCTS	TREATMENT FACILITIES	REMARKS
A	Valmac Industries, Inc.	2042	Arkansas River	Not Connected	Lake Langhofer	Poultry	Oxidation pond	
B	Ravick Mfg. Co., Inc.	2433	Arkansas River	Not Connected	None	Wood roof trusses, pre-fab wall panels, pre-hung door units		
G	International Paper Co.	2621	Arkansas River	Not Connected	Arkansas River	Polyethelene-coated bleached paper board, newsprint	Oxidation ponds, primary clarifier, aeration lagoon, septic tanks	Monitoring effluent under an EPA permit, Arkansas permit
C	Weyerhaeuser Co., Inc.	2631	Arkansas River	Not Connected	Arkansas River	Unbleached Kraft paper and paper-board	Primary clarifier, aeration lagoon	Monitoring effluent under an EFA permit
D	Hudson Pulp and Paper Corporation	2643	Arkansas River	Connected	None	Multiwall paper shipping sacks, manufactured from purchased paper	Pre-treatment before discharge into sewer system	
C	Weyerhaeuser Co.-Dierks Div. Multiwall Bags	2643	Arkansas River	Not Connected	Caney Bayou	See above	Oxidation pond	Monitoring effluent under Arkansas permi
A	Allied Chemical Corp.	2819	Arkansas River	Not Connected	Lake Langhofer	Liquid alum	Oxidation Pond	
G	U.S. Army - Pine Bluff Arsenal	3483	Arkansas River	Not Connected	Arkansas River and Caney Bayou	White phosphorous rocket warheads & artillery shells incenuiary munitions & various smoke munitions	Clarigester trickling filter, oxidation pond, neutralization & chlorination basin.	Treatment facilities for domestic wastes only.
A	Dickey Machine Works	3522	Arkansas River	Not Connected	None	Rear mount cultivators and spray equipment	Septic tanks	
A	Strong Mfg. Co., Inc.	3531	Arkansas River	Not Connected	None	Aggregate mixing machinery slurry pumps	Septic tanks	
A	Monark Shipyards, Inc.	3732	Arkansas River	Not Connected	Arkansas River	Boat construction		
C	National Center for Toxicological Research	None	Arkansas River	Not Connected	Arkansas River	Research studies dealing with effects of long term exposure to low concentrations of environmental chemicals	Clarigester, trickling filter, finishing oxidation pond, neutralization and chlorination basin	This complex is operated by the U.S. Food and Drug Administration on the Pine Bluff Arsenal
	B. Caney Bayou System							
A	Pepsi-Cola Bottling Co.	2086	Lower Caney	Connected	None	Bottled soft drinks		
A	Dixie Wood Preserving Co.	2491	Lower Caney	Not Connected	Caney Bayou	Pressure treated lumber & plywood, fire retardant	Oxidation ponds	

B. Caney Bayou System

	[illegible] Bottling Co.	2086	Lower Caney	Connected	None	Bottled soft drinks		
	[illegible] Preserving	2491	Lower Caney	Not Connected	Caney Bayou	Pressure treated lumber & plywood, fire retardant pressure-treated lumber & plywood	Oxidation ponds	
B	Viking Bag Division	2643	Lower Caney	Not Connected	Caney Bayou	Kraft bags and sacks from purchased paper	Oxidation pond	Oxidation pond operation under Arkansas permit
A	Independent Aluminum	3361	Lower Caney	Connected	Caney Bayou	Aluminum castings	Septic tanks	Serviced by White Hall
A	Pine Bluff Trailer Mfg. Company	3715	Lower Caney	Not Connected	Caney Bayou	Truck trailers and bodies	Septic tanks	
A	Pine Bluff Casket Co.	3994	Lower Caney	Connected	None	Metal and wood burial caskets		
B	Dr. Pepper Bottling Co., Inc.	2086	Oakland	Connected	None	Bottled soft drinks		
B	Nevada Mfg. Co.	2211	Oakland	Connected	None	Sheets, pillow cases, towels		
B	Seagram, Joseph E. & Sons, Inc.	2445	Oakland	Connected	None	Barrel staves and heads		
E	Brown Furniture Mfg. Co.	2511	Oakland	Connected	None	Wood household furniture		
A	Vangilder Poultry & Egg, Inc.	2015	Pine Bluff Lake	Connected	None	Eggs		

BRUMPS BAYOU SYSTEM

A	Valmac Industries, Inc.	2015	Brumps	Connected	Brumps Bayou	Poultry products	Vibrating screen for filtering offal and feather wastes	Although connected to the sewer system, occasional overflow enters Brumps Bayou
D	W.S. Fox & Sons, Inc.	2421	Brumps	Connected	Brumps Bayou	Lumber	Septic tank	Monitoring effluent under an EPA permit, septic tank effluent enters Brumps Bayou
C	Arkansas Oak Flooring Co.	2426	Brumps	Connected	Brumps Bayou	Oak flooring, rough lumber, stair treads, risers		Monitoring effluent under an EPA permit
A	Arkansas Pallet Co.	2499	Brumps	Connected	None	Hardwood pallets	Septic tank	
A	Whitten Concrete Co.	3272	Brumps	Connected	None			
C	Standard Brakeshoe and Fdy. Company	3323	Brumps	Connected	None	Mild carbon and low alloy steel castings		
D	Pearson, Ben, Mfg. Co., Inc.	3522	Brumps	Connected	None	Mechanical cotton pickers		
D	Ben Pearson-Brunswick	3949	Brumps	Connected	None	Archery equipment		

Table C-69
Pollution Loads by Storm: Station 7

Storm Date and Load (lbs.)

Parameter	14-15 May 1974 1/	25-26 July 1974 2/	10-15 Jan. 1975 3/	10-11 March 1975 4/
Oil & Grease	29,500	643	10,400	51.6
Nitrate	-	161	8818	2242
Nitrite	68.3	3.04	0	19.8
Ammonia	-	103	3469	478
Total Alk.	230,200	-	159,000	39,700
BOD_5	-	1751	62,200	13,870
COD	428,400	9079	450,000	78,400
T. Hardness	-	10,400	308,000	48,200
Ca Hardness	-	5697	132,000	31,700
Kjeldahl N.	-	572	27,500	3909
T. Phosphorus	-	229	3936	1016
T. Solids	3,514,000	53,800	2,855,000	286,500
S. Solids	2,644,000	37,100	1,494,000	63,300
V. Solids	-	14,000	640,000	119,900
Zinc	-	20.0	755	99.2
Lead	-	15.6	2241	198.4
Mercury	0	0.19	0	-
Cu	-	13.0	-	-
Ni	-	26.0	-	-
Cr	-	26.0	-	-

1/ Volume = 176,500,000 ft^3, Freq. = 1.45 years
2/ Volume = 4,169,000 ft^3, Freq. = 0.123 years
3/ Volume = 213,800,000 ft^3, Freq. = 2.50 years
4/ Volume = 31,800,000 ft^3, Freq. = 0.185 years

Source: U.S. Army Corps of Engineers, Vicksburg District, pers. comm.

C. Ouachita Basin

BARTHOLOMEW SYSTEM

B	Holsum Baking Co.	2051	Town Branch	Connected	None	Bread and bakery products	
B	Coca-Cola Bottling Co.	2086	Town Branch	Connected	None	Bottled soft drinks	
B	Cook Industries, Inc.	2091	Town Branch	Connected	None	Cottonseed processors	
A	Clark Printing Co., Inc.	2711	Town Branch	Connected	None	Newspaper & commercial printing	
C	Commercial Printing Co.	2711	Town Branch	Connected	None	See above	
A	Colortec	2741	Town Branch	Connected	None	Miscellaneous printing	
A	The Perdue Co., Inc.	2752	Town Branch	Connected	None	Commercial printers, catalogs, brochures, business forms	
A	Riverside-Planters Chemical Co.	2871-2879	Town Branch	Connected	None	Insecticides, herbicides, blend fertilizers	
B	Pine Bluff Sand and Gravel Co.	2951-3273	Town Branch	Connected	None	Asphalt, ready mix concrete, sand, quarry run stone, crushed stone	
A	Arkhola Sand and Gravel Co.	3271	Town Branch	Connected	None	Concrete blocks and brick	
A	Martin Machinery Co.	3441	Town Branch	Connected	None	Fabricated steel	
A	White's Auto Fisher	3949	Town Branch	Connected	None	Fishing tackle	
A	Moseley Cabinet and Millwork	2431	Interceptor Canal	Connected	None	Cabinets, wooden millwork, winding moulds	
A	Lawrence Cabinet Shop	2541	Interceptor Canal	Connected	None	Store fixtures and cabinets	
A	Arkansas Printing Co.	2751	Interceptor Canal	Connected	None	Commercial printing	
A	C.P. & W. Printing Ink Company	2893	Interceptor Canal	Connected	None	Printers ink	
A	Acme Plastic Products	3079	Interceptor Canal	Connected	None	Injection mouldings, pump, mop parts	
C	Varco-Pruden Div. of Dombrico, Inc.	3449	Interceptor Canal	Connected	None	Pre-fabricated steel buildings	
A	West Tool & Equipment Company	3522	Interceptor Canal	Connected	None	Attachments for cotton pickers	
C	Illinois/Eclipse Div. Illinois Tool Works, Inc.	3541	Interceptor Canal	Connected	None	Metalcutting tools	
F	Central Maloney, Inc.	3612	Interceptor Canal	Connected	None	Electrical transformers	
A	D & R Boat & Fiberglass Company	3979	Outlet Canal	Not Connected	Outlet Canal	Industrial fiberglass products	Septic tanks

			Canal			ings, pump, mop parts	
C	Varco-Pruden Div. of Dombrico, Inc.	3449	Interceptor Canal	Connected	None	Pre-fabricated steel buildings	
A	West Tool & Equipment Company	3522	Interceptor Canal	Connected	None	Attachments for cotton pickers	
C	Illinois/Eclipse Div. Illinois Tool Works, Inc.	3541	Interceptor Canal	Connected	None	Metalcutting tools	
F	Central Maloney, Inc.	3612	Interceptor Canal	Connected	None	Electrical transformers	
A	D & R Boat & Fiberglass Company	3979	Outlet Canal	Not Connected	Outlet Canal	Industrial fiberglass products	Septic tanks
A	American Sheetmetal Works, Inc.	3444	Outlet Canal	Connected	None	Sheet metal fabrication	
B	W & A Mfg. Co.	3522	Outlet Canal	Connected	None	Fertilizer distributers, grass control machines, chemical tanks, row markers	
A	Condray Sign & Advertising Co.	3993	Outlet Canal	Connected	None	Plastic and neon signs	
A	Sims Signs	3993	Outlet Canal	Connected	None	See above	
C	Pine Bluff Industries	2339	Harding	Connected	None	Women's sport clothes	
A	Lindley Printing Co.	2751	Harding	Connected	None	Commercial printing	
A	Pine Bluff Crating & Pallet Co.	2499	Lower Nevins	Connected	None	Wooden pallets, skids, lumber	
A	Wafford Mfg. Co.	2511	Lower Nevins	Connected	None	Dining chairs	

* Directory of Arkansas Industries, 1972.

**Employment Code: A (1-49); B (50-99); C (100-199); D (200-299); E (300-499); F (500-999); G (1,000-2,499); H (2,500 and over).

2

C. Ouachita Basin

BARTHOLOMEW SYSTEM

B	Holsum Baking Co.	2051	Town Branch	Connected	None	Bread and bakery products
B	Coca-Cola Bottling Co.	2086	Town Branch	Connected	None	Bottled soft drinks
B	Cook Industries, Inc.	2091	Town Branch	Connected	None	Cottonseed processors
A	Clark Printing Co., Inc.	2711	Town Branch	Connected	None	Newspaper & commercial printing
C	Commercial Printing Co.	2711	Town Branch	Connected	None	See above
A	Colortec	2741	Town Branch	Connected	None	Miscellaneous printing
A	The Perdue Co., Inc.	2752	Town Branch	Connected	None	Commercial printers, catalogs, brochures, business forms
A	Riverside-Planters Chemical Co.	2871-2879	Town Branch	Connected	None	Insecticide, herbicide, blend fertilizers
B	Pine Bluff Sand and Gravel Co.	2951-3273	Town Branch	Connected	None	Asphalt, ready mix concrete, sand [illegible]
A	Arkhola Sand and Gravel Co.	3271	Town Branch	Connected	None	Concrete [illegible]
A	Martin Machinery Co.	3441	Town Branch	Connected	None	[illegible]
A	White's Auto Fisher	3949	Town Branch	Connected	None	[illegible]
A	Moseley Cabinet and Millwork	2431	Interceptor Canal	Connected	None	Cabinets, wooden millwork, winding moulds
A	Lawrence Cabinet Shop	2541	Interceptor Canal	Connected	None	Store fixtures [illegible]
A	Arkansas Printing Co.	2751	Interceptor Canal	Connected	None	Commercial [illegible]
A	C.P. & W. Printing Ink Company	2893	Interceptor Canal	Connected	None	Printers' ink
A	Acme Plastic Products	3079	Interceptor Canal	Connected	None	[illegible]
C	Varco-Pruden Div. of Dombrico, Inc.	3449	Interceptor Canal	Connected	None	Pre-fabricated [illegible] buildings
A	West Tool & Equipment Company	3522	Interceptor Canal	Connected	None	Attachments [illegible]
C	Illinois/Eclipse Div. Illinois Tool Works, Inc.	354.	Interceptor Canal	Connected	None	Metal cutting [illegible]
F	Central Maloney, Inc.	361.	Interceptor Canal	Connected	None	[illegible] transformers
A	D & R Boat & Fiberglass Company	3979	Outlet Canal	Not Connected	Outlet Canal	Industrial [illegible], Septic tanks [illegible]
A	American Sheetmetal Works, Inc.	3444	Outlet Canal	Connected	None	Sheet metal fabrication
B	W & A Mfg. Co.	3522	Outlet Canal	Connected	None	Fertilizer [illegible] grass [illegible]
A	Condray Sign & Advertising Co.	3993	Outlet Canal	Connected	None	Plastic and neon signs
A	Sims Signs	3993	Outlet Canal	Connected	None	See above
C	Pine Bluff Industries	2339	Harding	Connected	None	Women's sport clothes
A	Lindley Printing Co.	2751	Harding	Connected	None	Commercial printing
A	Pine Bluff Crating & Pallet Co.	2499	Lower Nevins	Connected	None	Wooden pallets, skids, lumber
A	Wafford Mfg. Co.	2511	Lower Nevins	Connected	None	Dining chairs

* Directory of Arkansas Industries, 1972.

**Employment Code: A (1-49); B (50-99); C (100-199); D (200-299); E (300-499); F (500-999); G (1,000-2,499); H (2,500 and over).

Table C-69
Pollution Loads by Storm: Station 7

Storm Date and Load (lbs.)

Parameter	14-15 May 1974 1/	25-26 July 1974 2/	10-15 Jan. 1975 3/	10-11 March 1975 4/
Oil & Grease	29,500	643	10,400	51.6
Nitrate	-	161	8818	2242
Nitrite	68.3	3.04	0	19.8
Ammonia	-	103	3469	478
Total Alk.	230,200	-	159,000	39,700
BOD_5	-	1751	62,200	13,870
COD	428,400	9079	450,000	78,400
T. Hardness	-	10,400	308,000	48,200
Ca Hardness	-	5697	132,000	31,700
Kjeldahl N.	-	572	27,500	3909
T. Phosphorus	-	229	3936	1016
T. Solids	3,514,000	53,800	2,895,000	286,500
S. Solids	2,644,000	37,100	1,494,000	63,300
V. Solids	-	14,000	640,000	119,900
Zinc	-	20.0	755	99.2
Lead	-	15.6	2241	198.4
Mercury	0	0.19	0	-
Cu	-	13.0	-	-
Ni	-	26.0	-	-
Cr	-	26.0	-	-

1/ Volume = 176,500,000 ft^3, Freq. = 1.45 years
2/ Volume = 4,169,000 ft^3, Freq. = 0.123 years
3/ Volume = 213,800,000 ft^3, Freq. = 2.50 years
4/ Volume = 31,800,000 ft^3, Freq. = 0.054 years

Source: U.S. Army Corps of Engineers, Vicksburg District, pers. comm.

Table C-70
Pollution Loads by Storm: Station 8a

Parameter	July 25-26 1974 1/	January 10-11 1975 2/	March 10-11 1975 3/
	Storm Date and Load (lbs)		
Oil & Grease	204	288	0
Nitrate	129.4	273	
Nitrite	1.19	0	0.74
Ammonia	4.76	73	22.0
T. Alk.		9747	1995
BOD_5	1488	1862	451
COD	5262	12,100	2518
T. Hardness	2703	12,300	2526
Ca. Hardness	1631	8980	1973
Kjeldahl N.	320	898	157
T. Phosphorous	24.8	136.8	17.3
T. Solids	43,700	138,400	17,966
S. Solids	38,500	97,100	8917
V. Solids	4096	25,005	4823
Zinc	16.2	72.3	9.50
Lead	8.8	78.8	7.36
Mercury	0.127	0	-
Cu	5.95	-	-
Ni	11.9	-	-
Cr	11.9	-	-

1/ Volume = 1,908,000 ft^3, Freq. = 0.04 years
2/ Volume = 5,850,000 ft^3, Freq. = 0.16 years
3/ Volume = 1,180,000 ft^3, Freq. = 0.03 years

Source: U.S. Army Corps of Engineers, Vicksburg District, pers. comm.

Table C-71
Pollution Loads by Storm: Station 1

Parameter	Storm Date and Load (lbs) 6-7 Dec. 1974 1/	Storm Date and Load (lbs) 22-23 Feb. 1975 2/
Oil & Grease	1486	2616
Nitrate	1052	912
Nitrite	0	0
Ammonia	27.0	104.2
T. Alk	1311	12,536
BOD_5	1698	3731
COD	8558	29,400
T. Hardness	3220	11,900
Ca Hardness	1964	6002
Kjeldahl N.	117	2095
T. Phosphorus	7.43	31.2
T. Solids	21,800	208,800
S. Solids	8900	100,100
Volatile Solids	4054	70,400
Zinc	11.3	78.8
Lead	32.2	104.2
Mercury	0.20	0.77

1/ Volume = 3,609,000 ft^3, Freq. = 0.027 years
2/ Volume = 16,700,000 ft^3, Freq. = 0.0125 years

Source: U.S. Army Corps of Engineers, Vicksburg District, pers. comm.

Table C-72
Pollution Loads by Storm: Station 2

	Storm Date and Load (lbs)			
Parameter	14-15 May 1974 1/	25-26 July 1974 2/	6-7 Dec 1974 3/	22-23 Feb 1975 4/
Oil & Grease	624	528	11.93	667
Nitrate	-	116	349	111
Nitrite	1.99	1.91	1.03	0
NH_4-N	-	10.1	12.8	26.9
Alkalinity	2,607		1,782	7,032
BOD_5	-	1,511	522	1,304
COD	6,084	5,569	2,378	8,037
T. Hardness	-	3,949	1,907	5,164
Ca Hardness	-	1,568	1,281	4,099
K. Nitrogen	-	637	81	538
T. Phosphates	-	28.8	13.3	33.8
T. Solids	188,000	419,000	16,900	163,400
S. Solids	170,000	399,000	9,600	128,000
V. Solids	-	40,600	2,900	18,300
Zinc	-	27.1	7.8	33.4
Lead	-	14.71	14.7	20.1
Mercury	0.018	0.168	0	0
Cu	-	10.51	-	-
Ni	-	21.02	-	-
Cr	-	21.02	-	-

1/ Volume = 2,381,000 ft^3, Freq. = 0.052 years
2/ Volume = 3,368,000 ft^3, Freq. = 0.08 years
3/ Volume = 1,180,000 ft^3, Freq. = 0.032 years
4/ Volume = 3,220,000 ft^3, Freq. = 0.074 years

Source: U.S. Army Corps of Engineers, Vicksburg District, pers. comm.

TABLE C-73
Pollution Loads by Storm: Station 3

	Storm Date and Load (lbs)	
Parameter	14-15 May 1974 1/	25-26 July 1974 2/
Oil & Grease	21,300	6310
Nitrate	-	1452
Nitrite	129.8	10.0
Ammonia	-	559
Total Alk.	109,800	-
BOD_5	-	12,040
COD	289,500	53,700
T. Hardness	-	260
Ca Hardness	-	21,400
Kjeldahl N.	-	4034
T. Phosphorous	-	260
T. Solids	2,583,000	691,000
S. Solids	1,727,000	661,000
V. Solids	-	92,700
Zinc	-	183.7
Lead	-	121.8
Mercury	0.18	2.40
Cu	-	99.8
Ni	-	199.7
Cr	-	199.7

1/ Volume = 160,000,000 ft^3, Freq. = 0.65 years
2/ Volume = 32,000,000 ft^3, Freq. = 0.04 years

Source: U.S. Army Corps of Engineers, Vicksburg District, pers. comm.

Table C-74
Pollution Loads by Storm: Station 4

Storm Date and Load (lbs)

Parameter	14-15 May 1974 1/	25-26 July 1974 2/	6-7 Dec. 1974 3/	22-23 Feb. 1975 4/
Oil & Grease	655	977	4.0	574
Nitrate	-	461	177	118
Nitrite	2.57	7.0	0.77	0.60
Ammonia	-	121	3.7	188
Total Alk.	3669	-	1535	13,800
BOD_5	-	4841	654	1238
COD	9356	19,700	859	6006
T. Hardness	-	11,400	1642	8525
Ca. Hardness	-	10,100	1054	7363
K. Nitrogen	-	1596	49	587
T. Phosporous	-	107	13.2	40
T. Solids	45,700	281,000	7933	44,800
S. Solids	26,800	270,000	4334	19,800
Volatile S.	-	31,700	1730	9513
Zinc	-	35.4	3.7	25.8
Lead	-	58	3.7	19.4
Mercury	0.31	0.205	0	0.0114
Cu	-	23.3	-	-
Ni	-	46.5	-	-
Cr	-	46.5	-	-

1/ Volume = 2,940,000 ft^3, Freq. = 0.031 years
2/ Volume = 7,459,000 ft^3, Freq. = 0.062 years
3/ Volume = 588,600 ft^3, Freq. = 0.022 years
4/ Volume = 3,105,000 ft^3, Freq. = 0.037 years

Source: U.S. Army Corps of Engineers, Vicksburg District, pers. comm.

TABLE C-75
Pollution Loads by Storm: Station 5

	Storm Date and Load (lbs)		
Parameter	14-15 May 1974 1/	25-26 July 1974 2/	6-7 Dec. 1974 3/
Oil & Grease	30,400	3746	0
Nitrate	-	914	4700
Nitrite	9.5	15.4	0
Ammonia	-	110	112.9
Total Alk.	175,600	-	8592
BOD_5	-	6751	5610
COD	288,900	47,900	24,100
T. Hardness	-	55,900	15,200
Ca Hardness	-	32,000	7900
Kjeldahl N.	-	3285	438
T. Phosphorous	-	169	74
T. Solids	1,886,000	381,600	77,000
S. Solids	1,166,000	276,800	206,400
V. Solids	-	49,100	26,400
Zinc	-	106	45.5
Lead	-	69.9	126.4
Mercury	0.95	2.94	0.29
Cu	-	69.9	-
Ni	-	140	-
Cr	-	140	-

1/ Volume = 163,600,000 ft^3, Freq. =0.016 years
2/ Volume = 22,400,000 ft^3, Freq. =0.027 years
3/ Volume = 13,500,000 ft^3, Freq. =0.023 years

Source: U.S. Army Corps of Engineers, Vicksburg District, pers. comm.

Table C-76

Pollution Load Frequencies: Station 7

LOAD IN LBS

PARAMETER	YEARLY PROBABILITY 0.1	0.2	0.5	1.0	2.0	4.0	5.0	6.67	8	10	20	30	40	50	AVERAGE ANNUAL LOAD
BOD_5	69,000	66,500	61,500	56,500	49,500	39,500	36,000	31,500	28,500	25,000	14,000	8,000	2,600	0	763,000
COD	550,000	510,000	444,000	376,000	308,000	240,000	220,000	190,000	175,000	150,000	85,000	48,000	20,000	0	4,766,000
SUSPENDED SOLIDS	2,410,000	2,320,000	2,140,000	1,920,000	1,670,000	1,300,000	1,190,000	1,030,000	930,000	810,000	480,000	270,000	100,000	0	25,553,000
TOTAL PHOSPHORUS	4,210	4,090	3,780	3,350	2,760	[illegible]	2,000	1,760	1,600	1,410	820	500	240	0	44,400
KJELDAHL NITROGEN	30,000	29,100	27,000	23,000	18,900	14,300	13,500	12,000	10,900	9,500	5,500	3,000	1,500	0	303,000
MERCURY															
ZINC	835	810	725	620	510	405	370	320	290	260	150	[illegible]	40	0	5,150
OIL & GREASE	22,700	21,800	20,000	18,000	15,000	11,300	10,700	9,200	8,200	7,200	4,100	2,500	1,000	0	230,000

SOURCE: U.S. Army Corps of Engineers, Vicksburg District, pers. comm.

Table C-77

Pollution Load Frequencies: Station 8a

LOAD IN LBS

PARAMETER	YEARLY PROBABILITY 0.1	0.2	0.5	1.0	2.0	4.0	5.0	6.67	8	10	20	30	40	50	AVERAGE ANNUAL LOAD
BOD_5	4,450	4,400	4,300	4,100	3,700	2,900	2,650	2,300	2,100	1,850	1,050	580	250	0	56,600
[illegible]	24,900	24,700	24,000	23,000	20,800	16,200	14,900	13,000	11,700	10,500	6,000	3,500	1,500	0	323,000
SUSPENDED SOLIDS	174,000	171,000	168,000	159,000	145,000	114,000	104,000	92,000	82,000	72,000	41,000	23,000	10,000	0	[illegible]
TOTAL PHOSPHORUS	232	228	220	210	190	149	135	119	107	95	55	30	13	0	2,921
KJELDAHL NITROGEN	1,505	1,490	1,440	1,370	1,240	960	870	770	700	620	350	200	80	0	18,900
MERCURY	0.176	0.174	0.169	0.160	0.145	0.113	0.105	0.090	0.082	0.071	0.041	0.023	0.010	0	2.21
[illegible]	[illegible]	116	112	107	95	75	68	60	55	48	27	15	6.5	0	[illegible]
OIL & GREASE	623	615	595	565	500	390	360	312	285	250	142	80	33	0	[illegible]

SOURCE: U.S. Army Corps of Engineers, Vicksburg District, pers. comm.

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Table C-78

Pollution Load Frequencies: Station 1

LOAD IN LBS

PARAMETER	YEARLY PROBABILITY 0.1	0.2	0.5	1.0	2.0	4.0	5.0	6.67	8	10	20	30	40	50	AVERAGE ANNUAL LOAD
BOD_5	9,350	9,300	9,050	8,650	7,800	6,150	5,600	4,900	4,500	3,800	2,200	1,250	550	0	119,000
COD	67,500	67,000	65,000	62,000	55,900	43,900	40,000	35,000	32,000	28,000	16,000	9,000	3,900	0	862,000
SUSPENDED SOLIDS	188,500	185,000	180,000	172,500	150,000	126,000	115,000	100,000	92,000	80,000	46,000	26,000	12,000	0	2,457,000
TOTAL PHOSPHORUS	72	71	69	66	60	47	43	38	34.5	30	17	9.5	4	0	919
KJELDAHL NITROGEN	4,350	4,000	3,900	3,700	3,350	2,600	2,400	2,100	1,900	1,650	960	520	220	0	51,100
MERCURY	1.76	1.74	1.68	1.60	1.45	1.14	1.02	0.90	0.82	0.72	0.41	0.22	0.10	0	22.07
ZINC	167	165	160	152	137	108	98	86	78	68	48	22	10	0	2,2[illegible]
OIL & GREASE	7,[illegible]00	7,700	7,450	7,100	6,400	5,000	4,600	4,000	3,600	3,200	1,800	1,000	520	0	98,700

SOURCE: U.S. Army Corps of Engineers, Vicksburg District, pers. comm.

Table C-79

Pollution Load Frequencies: Station 2

LOAD IN LBS

PARAMETER	YEARLY PROBABILITY 0.1	0.2	0.5	1.0	2.0	4.0	5.0	6.67	8	10	20	30	40	50	AVERAGE ANNUAL LOAD
BOD_5	3,860	3,820	3,720	3,560	3,100	2,620	2,400	2,100	1,900	1,680	970	520	230	0	50,900
COD	23,700	23,500	23,000	22,000	20,000	15,600	14,200	12,500	11,400	10,000	5,600	3,200	2,900	0	321,000
SUSPENDED SOLIDS	710.000	692,000	663,000	621,000	537,000	422,000	385,000	339,000	30[illegible],000	270,000	154,000	84,000	36,000	0	7,894,000
TOTAL PHOSPHORUS	92.5	92.0	90.5	86.0	78.0	61.0	56.0	49.0	45.0	39.0	22.0	12.5	5.5	0	1,199
NITRATE NITROGEN	1,630	1,620	1,580	1,500	1,350	1,050	950	850	760	670	490	2[illegible]0	1[illegible]0	0	21,900
MERCURY	0.346	0.342	0.328	0.304	0.255	0.200	0.183	0.160	0.145	0.129	0.073	0.042	0.020	0	4.01
ZINC	79.5	79.0	77.5	74.5	68.0	53.5	49.0	43.0	39.0	34.0	20.0	11.0	5.0	0	1,[illegible]
OIL & GREASE	1,910	1,[illegible]90	1,845	1,770	1,600	1,250	1,070	1,000	900	9[illegible]0	450	250	110	0	24,[illegible]

SOURCE: U.S. Army Corps of Engineers, Vicksburg District, pers. comm.

Table C-80

Pollution Load Frequencies: Station 3

LOAD IN LBS

PARAMETER	YEARLY PROBABILITY 0.1	0.2	0.5	1.0	2.0	4.0	5.0	6.67	8	10	20	30	40	50	AVERAGE ANNUAL LOAD
BOD_5															
COD	378,000	373,000	355,000	321,000	240,000	209,000	190,000	165,000	150,000	131,000	76,000	42,000	18,000	0	4,064,000
SUSPENDED SOLIDS	2,130,000	2,120,000	2,070,000	1,970,000	1,780,000	1,410,000	1,290,000	1,120,000	1,020,000	900,000	510,000	280,000	125,000	0	27,484,000
TOTAL PHOSPHORUS															
KJELDAHL NITROGEN															
MERCURY															
ZINC															
OIL & GREASE	26,600	26,300	25,600	24,300	21,400	16,600	15,200	13,300	12,000	10,500	6,000	3,300	1,500	0	326,000

SOURCE: U.S. Army Corps of Engineers, Vicksburg District, pers. comm.

Table C-81

Pollution Load Frequencies: Station 4

LOAD IN LBS

PARAMETER	YEARLY PROBABILITY 01	02	05	1.0	2.0	4.0	5.0	6.67	8	10	20	30	40	50	AVERAGE ANNUAL LOAD
BOD_5	13,300	13,200	12,800	12,200	11,000	8,600	7,800	6,850	6,200	5,500	3,200	1,750	750	0	169,000
COD	65,000	64,100	62,000	58,500	51,400	40,000	36,500	32,000	29,000	25,600	15,600	8,200	3,700	0	802,000
SUSPENDED SOLIDS	842,000	835,000	808,000	760,000	670,000	530,000	480,000	420,000	380,000	330,000	190,000	100,000	42,000	0	9,592,000
TOTAL PHOSPHORUS	335	330	320	306	275	216	198	173	157	137	79	44	20	0	4,247
KJELDAHL NITROGEN	4,860	4,820	4,690	4,460	4,000	3,130	2,860	2,500	2,250	2,000	1,150	650	270	0	61,[illegible]00
MERCURY	1.420	1.400	1.360	1.285	1.165	0.910	0.820	0.720	0.670	0.580	0.330	0.190	0.080	0	17.88
ZINC	134	133	129	123	110	86	78	69	62	55	32	17.5	7.5	0	1,695
OIL & GREASE	3,990	3,950	3,850	3,650	3,300	2,600	2,360	2,070	1,870	1,650	940	520	230	0	50,700

SOURCE: U.S. Army Corps of Engineers, Vicksburg District, pers. comm.

Table C-82

Pollution Load Frequencies: Station 5

LOAD IN LBS

PARAMETER	YEARLY PROBABILITY 0.1	0.2	0.5	1.0	2.0	4.0	5.0	6.67	8	10	20	30	40	50	AVERAGE ANNUAL LOAD
BOD_5	102,000	101,000	97,500	93,000	84,000	66,000	60,000	52,000	47,500	42,000	24,000	13,500	6,000	0	1,293,000
COD	523,000	519,000	505,000	485,000	440,000	350,000	319,000	278,000	252,000	220,000	127,000	70,000	30,000	0	6,735,000
SUSPENDED SOLIDS	2,570,000	2,510,000	2,400,000	2,275,000	2,050,000	1,610,000	1,460,000	1,280,000	1,170,000	1,020,000	600,000	330,000	150,000	0	[illegible],781,000
TOTAL PHOSPHORUS	1,360	1,350	1,300	1,220	1,050	820	750	650	597	520	295	160	70	0	[illegible]
KJELDAHL NITROGEN	30,750	30,350	29,000	27,300	23,500	18,500	16,800	14,700	13,300	11,700	6,700	3,700	1,600	0	[illegible]
MERCURY	5.00	4.95	4.75	4.45	3.90	3.06	2.80	2.44	2.21	[illegible]	1.11	0.60	0.26	0	59.9
ZINC	[illegible]	1,275	1,23[illegible]	1,155	1,000	790	720	630	570	[illegible]	290	[illegible]	[illegible]	0	[illegible]
OIL & GREASE	57,200	56,000	53,500	50,500	45,500	[illegible]	32,500	28,400	26,000	22,900	13,000	7,100	3,100	0	700,000

SOURCE. U.S. Army Corps of Engineers, Vicksburg District, pers. comm.

Appendix D

Biological Elements

SAMPLING METHODS

A. Bottom Composition. Three 9 x 9 inch Ekman grab samples were combined, air dried and subsampled at stations 1, 2, 3, 4, 5, 7, 9a and 10b. Large objects such as gravel, sticks and rubbish not retained by a No. 10 U.S. Standard Seive (2.00mm) were weighed to the nearest 0.1g. About 100g of the remaining soil was oxidized with 30% hydrogen peroxide until organic matter was removed; samples were dried and weighed. Exactly 50g of the remaining soil was disaggregated by the addition of 5ml neutral sodium hexametaphosphate and placed into a Bouyoucos Sedimentation Cylinder.
A hydrometer was used to determine per cent sand, silt and clay. Hydrometer readings taken at 40 seconds and 2 hours measured sand and silt composition, respectively. Clay composition was determined by subtraction of sand and silt from the original 50g sample.

B. Phytoplankton. April collections of phytoplankton at stations 1, 2, 3, 4, 5, 7, 9a and 10b consisted of a 1-gallon sample taken 6 inches below the surface and allowed to settle after preservation. Because the plankton was sparse, November samples were collected by pouring 50 gallons of water through a No. 20 mesh plankton net at all stations except 10b, where three vertical 20-foot hauls with the plankton net were made. Phytoplankton was preserved in 5% formalin and a 1.5% soap solution, identified and assigned relative abundance.

C. Aquatic Vegetation. Relative abundance and species composition for aquatic vegetation were determined at stations 1, 2, 3, 4, 5, 7, 9a and 10b. Plants were collected with a rake or by hand. Only those plants directly in contact with the water were considered.

D. Zooplankton. Samples were taken at stations 1, 2, 3, 4, 5, 7, 9a and 10b in April and November, 1974. All stations except 10b were sampled by pouring 50 gallons of water through a No. 20 mesh plankton net; three vertical 20-foot hauls were made at Station 10b. Samples were preserved in 5% formalin, identified and assigned relative abundance.

E. Epibenthos. Epibenthos were collected at stations 1, 2, 3, 4, 5, 7, 9a and 10b in April and November, 1974. Fifteen 3-foot sweeps with a Turtox 9-inch diameter mouth sweepnet (bar mesh = 1mm) were made through emergent vegetation, along shorelines, in littoral habitats or immediately above the substrate. Organisms were preserved in 5% formalin, identified and quantified per 15 sweeps.

F. Benthos. April and November collections of benthos at stations 1, 2, 3, 4, 5, 7, 9a and 10b consisted of six, 9 x 9-inch Ekman dredge grabs taken equidistant across the water body. Samples were preserved in 5% formalin and later treated with a Rose Bengal dye-isopropanol solution and separated from the substrate. Organsims were identified and quantified by numbers and biomass (using volumetric displacement). Diversity indices were calculated according to Wilhm (1970).

G. Fishes. Stations 1, 3, 5, 7 and 10b were sampled for fishes in April, May, June and November, 1974. Methods used depended upon water velocity, depth, channel configuration, water temperature and the number of snags. All fishes were weighed to the nearest 0.1g, measured to the nearest 1.0mm total length and assigned relative abundance and biomass per surface acre of water.

1. Minnow Seine. A 10-foot (3.1 m) by 4-foot (1.2 m) minnow seine of 1/8 inch (3.2mm) bar mesh was used at suitable stations. The minnow seine was not used at Station 7 during any period, nor at Station 5 in November.

2. Bag Seine. A 30-foot (9.3 m) by 4-foot (1.2 m) bag seine of ½ inch (12.7mm) stretch mesh was used in conjunction with the minnow seine.

3. Gill Nets. Two 100-foot (31.3 m) by 6-foot (1.9 m) flag-type gill nets, each with 1/3 of the total area consisting of 1-inch (2.5cm), 2-inch (5.0cm) and 3-inch (7.5cm) mesh, were set at Station 10b in May, 1974. Catch data from both were combined into a single catch per unit effort designation. Stream velocities precluded usage of gill nets at all other stations.

4. Rotenone. All fish sampling sites except Station 3 were treated with 4-6 pounds (1.8-2.7kg) of rotenone per acre-foot of water in June, 1974. Fishes were collected up to 4 hours after rotenone applications. All rotenone samples are considered representative except those from Station 5, where water velocities in the main channel carried the rotenone quickly downstream. The Arkansas Game and Fish Commission conducted all rotenone sampling.

H. Overstory and Understory Vegetation. Eight study area phytogeographic regions were analysed for terrestrial vegetation. These vegetative associations were determined mainly by field reconnaissance. Species composition

was determined by conducting vegetative transects. Each transect represented a straight line at least 100 yards (91.4m) long and 10 feet (3.1m) wide. All vegetation within each transect was divided into overstory and understory and was differentiated according to diameter size. Plants having a diameter of about two inches (5.1cm) or more were considered overstory. Each overstory plant was tabulated and quantified. Relative abundance was estimated for each understory species within the transects. A total of 31 transects were conducted within the study area with at least two transects taken in each phytogeographic region.

Table D-1
Phytoplankton of the Pine Bluff Study Area Stations*

STATION NO.	TAXON	RELATIVE ABUNDANCE
1	CHLOROPHYTA	Infrequent
	CYANOPHYTA	Infrequent
	CHRYSOPHYTA	Rare
	RHODOPHYTA	
	Batrachospermum sp.	Infrequent
2	CHLOROPHYTA	
	Spirogyra spp.	Frequent
	Closterium spp.	Rare
	Microspora sp.	Infrequent
	CHRYSOPHYTA	Abundant
	CYANOPHYTA	
	Oscillatoria spp.	Infrequent
3	CHRYSOPHYTA	Infrequent
	CYANOPHYTA	
	Oscillatoria spp.	Infrequent
4	CHRYSOPHYTA	Infrequent
	CYANOPHYTA	
	Merismopedia sp.	Infrequent
	CHLOROPHYTA	
	Closterium spp.	Frequent
	Scenedesmus spp.	Infrequent
	Pandorina morum	Infrequent
	Gonium pectorale	Infrequent
5	CHRYSOPHYTA	Infrequent
	CHLOROPHYTA	
	Closterium spp.	Rare
	CYANOPHYTA	
	Oscillatoria spp.	Rare
7	CYANOPHYTA	
	Oscillatoria spp.	Frequent
9a	CHLOROPHYTA	
	Pediastrum spp.	Abundant
	Microspora spp.	Infrequent
	Spirogyra spp.	Rare

Table D-1 (continued)

9a (continued)	CYANOPHYTA	
	Microcystis spp.	Frequent
	Anabaena spp.	Rare
10b	CHRYSOPHYTA	
	Gomphonema spp.	Rare
	Navicula spp.	Infrequent
	CHLOROPHYTA	
	Scenedesmus spp.	Abundant
	Scenedesmus quadricauda	Frequent
	Pediastrum spp.	Abundant
	Pandorina morum	Frequent
	Gonium pectorale	Frequent
	CYANOPHYTA	
	Anabaena spp.	Abundant
	Merismopedia spp.	Abundant

* This list represents only the predominant taxa at the Study Area stations. It is not to be considered comprehensive or complete. It is, however, the only algal list for the Study Area stations to date. Further investigations should yield additional taxa.

Table D-2
Vascular Plants of Jefferson County*

SCIENTIFIC NAME COMMON NAME	HABITAT REQUIREMENTS	RELATIVE ABUNDANCE**
ACANTHACEAE		
Justicia ovata Water Willow	Shallow water	C
Ruellia humilis Wild Petunia	Open forests; old fields	[illegible]
Ruellia pedunculata Wild Petunia	Open woods along streams	U
Ruellia strepens Wild Petunia	Rich woods	U
ACERACEAE		
Acer negundo Box Elder	River banks and floodplain woods	A
Acer rubrum Red Maple	Woods	A
Acer saccharinum Silver Maple	Along streams and wettish flat woodlands	U
AIZOACEAE		
Mollugo verticillata Carpet-weed	Waste areas	U
ALISMATACEAE		
Echinodorus cordifolius Burhead	Shallow water	C
Sagittaria sp. Arrowhead	Shallow water	C
Sagittaria graminea Arrowhead	Shallow water	U
Sagittaria g. platyphylla Delta Duck Potato	Shallow water	C
Sagittaria latifolia Common Arrowhead	Shallow water	C
Sagittaria montevidensis calcina Arrowhead	Shallow water	U

Table D-2 (continued)

AMARANTHACEAE		
<u>Alternanthera</u> <u>philoxeroides</u> Alligatorweed	Streams and ponds	A
<u>Amaranthus</u> <u>arenicola</u> Pigweed	Dried ponds, lake shores, fields and roadsides	C
<u>Amaranthus</u> <u>powellii</u> Pigweed	Open waste areas	C
<u>Amaranthus</u> <u>retroflexus</u> Pigweed	Open waste areas	C
<u>Amaranthus</u> <u>tamariscinus</u> Pigweed	Waste areas	U
<u>Froelichia</u> <u>floridana</u> Cottonweed	Dry fields and sandy soils	C
<u>Iresine</u> <u>rhisomatosa</u> Bloodleaf	Sandy alluvial soils	C
AMARYLLIDACEAE		
<u>Agave</u> <u>virginica</u> False Aloe	Open woods, sandy soil	U
<u>Hymenocallis</u> <u>occidentalis</u> Spider Lily	Wet areas, shallow water	C
<u>Hypoxis</u> <u>hirsuta</u> Stargrass	Open woods and pastures	C
ANACARDIACEAE		
<u>Rhus</u> <u>copallina</u> Dwarf Sumac	Woods and bottomlands	C
<u>Rhus</u> <u>glabra</u> Smooth Sumac	Open woods, waste areas	C
<u>Rhus</u> <u>radicans</u> Poison Ivy	Woods	A
ANNONACEAE		
<u>Asimina</u> <u>triloba</u> Pawpaw	Rich woods and banks of streams	U
APOCYNACEAE		
<u>Apocynum</u> <u>cannabinum</u> Indian Hemp	Along ditches and streams	C

Table D-2 (continued)

Trachelospermum difforme Trachelospermum	Along streams and forest edges	C
Vinca major Periwinkle	Along streams and forest edges	U
AQUIFOLIACEAE		
Ilex ambigua Carolina Holly	Sandy woods, along streams	K
AQUIFOLIACEAE		
Ilex decidua Deciduous Holly	Woods	C
Ilex opaca American Holly	Moist woods and banks of streams	U
ARACEAE		
Arisaema dracontium Green Dragon	Rich woodlands and alluvial soils	C
ARALIACEAE		
Aralia spinosa Hercules Club	Woodlands along streams	U
ASCLEPIADACEAE		
Asclepias perennis Milkweed	Swampy ground and alluvial woods	U
Asclepias tuberosa Butterflyweed	Fields, thickets and open woods	C
Asclepias variegata Milkweed	Thickets and open woods	U
Cynanchum laeve Cynanchum	Moist woods, fields	C
BALSAMINACEAE		
Impatiens capensis Spotted Touch-me-not	Wet woods	U
BERBERIDACEAE		
Podophyllum peltatum May Apple	Rich woods along streams	C

Table D-2 (continued)

BETULACEAE		
Alnus serrulata Common Alder	Stream banks	K
Betula nigra River Birch	Stream banks and lake shores	C
Corylus americana Hazelnut	Woods	U
Ostrya virginiana Hop Hornbeam	Woods	C
Carpinus caroliniana Ironwood, Hornbeam	Woods along stream valleys	C
BIGNONIACEAE		
Bignonia capreolata Cross Vine	Moist woods	C
Campsis radicans Trumpet Creeper	Bottomlands and thickets	C
Catalpa speciosa Catalpa	Open woods, cultivated	C
BORAGINACEAE		
Heliotropium indicum Indian Heliotrope	River banks, lake shores	C
Myosotis virginica Scorpion Grass	Rich woods and bottomlands	C
Heliotropium convolvulaceum Heliotrope	Open areas, roadsides	U
CACTACEAE		
Opuntia compressa Prickly Pear Cactus	Open areas	U
CAMPANULACEAE		
Lobelia appendiculata Lobelia	Moist places in pinelands old fields, roadsides	C
Lobelia cardinalis Cardinal Flower	Along streams of fields, roadsides and open bottomlands	C
Lobelia puberula Lobelia	Moist areas of bottomlands, streams	C

Table D-2 (continued)

Triodanis perfoliata Venus' Looking Glass	Fields, roadsides and waste areas	A
CAPRIFOLIACEAE		
Lonicera japonica Japanese Honeysuckle	Woods, thickets, waste areas	A
Lonicera sempervirens Trumpet Honeysuckle	Woods, thickets, waste areas	C
Sambucus canadensis Common Elderberry	Open woods, waste areas, old fields	A
Viburnum prunifolium Black Haw	Moist or dry woods	U
Viburnum rufidulum Southern Black Haw	Edge of woods, streamsides	U
CARYOPHYLLACEAE		
Arenaria patula Sandwort	Fields	U
Sagina decumbens Pearlwort	Fields and open woods	C
Silene antirrhina Sleepy Catchfly	Moist grassy areas, fields	K
Stellaria media Common Chickweed	Lawns, roadsides, waste areas	A
Saponaria officinalis Soapwort	Open areas, old fields, roadsides	C
CELASTRACEAE		
Euonymus americanus Strawberry Bush	Along streams and bottomlands	C
CHENOPODIACEAE		
Chenopodium album Lamb's Quarters	Roadsides, fields and waste areas	U
Chenopodium ambrosioides Mexican Tea	Waste places	C
Cyclolom atriplicifolium Winged Pigweed	Waste places	C

Table D-2 (continued)

CISTACEAE		
Lechea tenuifolia Pinweed	Roadsides, fields, open woods	C
Lechea villosa Pinweed	Roadsides, fields, open woods	C
COMMELINACEAE		
Commelina communis Dayflower	Stream banks and open areas	C
Commelina diffusa Dayflower	Bottomlands	U
Commelina virginica Dayflower	Bottomlands	C
Tradescantia hirsutiflora Spiderwort	Open woods and streambanks	C
Tradescantia ohiensis Spiderwort	Meadows, thickets, roadsides	A
Tradescantia tharpii Spiderwort	Open woods	U
Tradescantia occidentalis Spiderwort	Open fields, roadsides	U
COMPOSITAE		
Achillea millefolium Yarrow	Open woods, roadsides, fields	C
Ambrosia artemisiifolia Common Ragweed	Waste areas	C
Ambrosia bidentata Ragweed	Waste areas	C
Ambrosia trifida Giant Ragweed	Waste areas	C
Antennaria plantaginifolia Pussy's Toes	Moist open areas, fields	C
Anthemis cotula Mayweed	Waste places, cultivated	C
Aster dumosus Aster	Roadsides, fields	C

Table D-2 (continued)

Aster ericoides Wreath Aster	Roadsides, fields	C
Aster exilis Aster	Roadsides, fields	C
Aster lateriflorus White Woodland Aster	Woods	C
Aster linariifolius Aster	Roadsides, fields	C
Aster ontarionis Aster	Roadsides, fields	C
Aster paludosus Aster	Roadsides, fields	C
Aster pilosus White Heath Aster	Roadsides, fields	C
Aster patens Spreading Aster	Roadsides, fields	C
Aster turbinellus Aster	Roadsides, fields	C
Aster umbellatus Aster	Roadsides, fields	C
Aster vimineus Small White Aster	Roadsides, fields	C
Baccharis halimifolia Groundsel Tree	Open sandy areas	C
Bidens aristosa Tickseed Sunflower	Moist open areas	C
Bidens bipinnata Spanish Needles	Moist open areas	C
Boltonia asteroides Boltonia	Roadsides and fields	C
Boltonia diffusa Boltonia	Roadsides and fields	C
Centaurea cyanus Cornflower	Roadsides, cultivated	K

Table D-2 (continued)

<u>Cirsium</u> <u>altissimum</u> Tall Thistle	Roadsides, fields, waste areas	C
<u>Cirsium</u> <u>carolinianum</u> Thistle	Roadsides, fields, waste areas	C
<u>Cirsium</u> <u>discolor</u> Thistle	Roadsides, fields, waste areas	C
<u>Cirsium</u> <u>horridulum</u> Bull Thistle	Roadsides, fields, waste areas	C
<u>Coreopsis</u> <u>tinctoria</u> Tickseed	Moist open areas	C
<u>Coreopsis</u> <u>grandiflora</u> Tickseed	Sandy, wooded areas	U
<u>Coreopsis</u> <u>lanceolata</u> Tickseed Coreopsis	Open areas	U
<u>Coreopsis</u> <u>pubescens</u> Star Tickseed	Open areas	K
<u>Coreopsis</u> <u>tripteris</u> Tall Tickseed	Open areas, roadsieds	C
<u>Dracopis</u> <u>amplexicaulis</u> Dracopis	Moist open areas	C
<u>Echinacea</u> <u>pallida</u> Purple Cone-flower	Open wood hillside	C
<u>Eclipta</u> <u>alba</u> Yerba de Tago	Edges of streams, ponds and lakes	C
<u>Elephantopus</u> <u>carolinianus</u> Carolina Elephants'-foot	Dry woods	C
<u>Elephantopus</u> <u>tomentosus</u> Hairy Elephants'-foot	Dry woods	C
<u>Erechtites</u> <u>hieracifolia</u> Fireweed	Roadsides, open woods	C
<u>Erigeron</u> <u>annuus</u> Fleabane	Roadsides, fields	C
<u>Erigeron</u> <u>canadensis</u> Horseweed	Roadsides, fields	C
<u>Erigeron</u> <u>philadelphicus</u> Philadelphia Fleabane	Roadsides, fields	C

Table D-2 (continued)

Erigeron pusillus Horseweed	Roadsides, fields	C
Erigeron strigosus Daisy Fleabane	Roadsides, fields	C
Erigeron tenuis Fleabane	Roadsides, fields	C
Eupatorium album Thoroughwort	Roadsides, fields and woods	U
Eupatorium capillifolium Dog-fennel	Roadsides, fields and woods	U
Eupatorium coelestinum Mistflower	Roadsides, wooded areas	C
Eupatorium hyssopifolium Thoroughwort	Open areas	R
Eupatorium incarnatum Boneset	Roadsides, thickets	U
Eupatorium perfoliatum Boneset	Moist sandy areas	U
Eupatorium rotundifolium Thoroughwort	Open woods	C
Eupatorium rugosum White Snakeroot	Open areas, fields	C
Eupatorium serotinum Thoroughwort	Open areas, fields	C
Facelis retusa Facelis	Sandy soils	U
Gnaphalium obtusifolium Rabbit Tobacco	Roadsides and open fields	U
Gnaphalium purpureum Purple Cudweed	Sandy soils	U
Haplopappus ciliatus Haplopappus	Sandy soils, river edges	C
Haplopappus divaricatus Haplopappus	Sandy soils, river edges	C
Helenium amarum Bitter Weed	Roadsides and open fields	A

Table D-2 (continued)

Helenium campestre Sneeze Weed	Roadsides and open fields	U
Helenium flexuosum Sneeze Weed	Moist sandy areas	U
Helianthus angustifolius Sunflower	Roadsides, fields, open areas	C
Helianthus annuus Common Sunflower	Roadsides, fields, open areas	C
Helianthus divaricatus Sunflower	Roadsides, fields, open areas	U
Helianthus grosseserratus Sunflower	Roadsides, fields, open areas	U
Helianthus hirsutus Sunflower	Roadsides, fields, open areas	U
Helianthus maximiliani Maximilian Sunflower	Roadsides, fields, open areas	U
Heliopsis helianthoides Ox-eye	Roadsides, fields, open areas	C
Hieracium gronovii Hawkweed	Fields	C
Heterotheca graminifolia Silk Grass	Roadsides, fields, open areas	C
Heterotheca latifolia Golden Aster	Roadsides, fields, open areas	C
Heterotheca pilosa Camphor Weed	Roadsides, fields, open areas	C
Iva annua Marsh-elder	Wet areas, open stream sides	C
Krigia dandelion Potato Dandelion	Lawns, fields, open areas	A
Krigia oppositifolia Dwarf Dandelion	Lawns, fields, open areas	C
Lactuca canadensis Wild Lettuce	Roadsides, fields, open areas	C
Lactuca floridana Wild Lettuce	Roadsides, fields, open areas	U

Table D-2 (continued)

Lactuca serriola Prickly Lettuce	Roadsides, fields, open areas	C
Liatris aspera Blazing-star	Roadsides, old fields	C
Liatris pycnostachya Blazing-star	Roadsides, old fields	C
Mikania scandens Climbing Hempweed	Moist open woods, fields, roadsides	C
Prenanthes alba White Lettuce	Bottomland woods	U
Prenanthes altissima Rattlesnake Root	Bottomland woods	U
Prenanthes serpentaria Gall-of-the-Earth	Open woods	K
Pluchea camphorata Stinkweed	Moist areas	C
Polymnia uvedalia Bearsfoot	Near streams	U
Pyrrhopappus carolinianus False Dandelion	Lawns, fields, roadsides	C
Rudbeckia hirta Black-eyed Susan	Fields, roadsides, open areas	C
Rudbeckia grandiflora Coneflower	Fields, roadsides, open areas	C
Rudbeckia subtomentosa Coneflower	Fields, roadsides, open areas	C
Senecio glabellus Butterweed	Moist open woods, fields, roadsides	C
Senecio tomentosus Ragwort	Woods	C
Silphium integrifolium Rosin-weed	Roadsides, fields	U
Solidago arguta Goldenrod	Roadsides, fields, waste areas	C
Solidago caesia Bluestem Goldenrod	Roadsides, fields, waste areas	C

Table D-2 (continued)

Solidago canadensis Goldenrod	Roadsides, fields, waste areas	C
Solidago gigantea Goldenrod	Roadsides, fields, waste areas	U
Solidago hispida Goldenrod	Roadsides, fields, waste areas	C
Solidago leptocephala Goldenrod	Roadsides, fields, waste areas	C
Solidago nemoralis Goldenrod	Roadsides, fields, waste areas	C
Solidago odora Sweet Goldenrod	Roadsides, fields, waste areas	C
Solidago petiolaris Goldenrod	Roadsides, fields, waste areas	C
Solidago radula Goldenrod	Roadsides, fields, waste areas	C
Solidago rugosa Rough-leaved Goldenrod	Roadsides, fields, waste areas	C
Soliva pterosperma Burweed	Roadsides, fields, waste areas, lawns	C
Sonchus asper Spiny-leaved Sow Thistle	Roadsides, fields, waste areas	C
Spilanthes americana Creeping Spotflower	Roadsides, fields, waste areas	U
Taraxacum officinale Dandelion	Lawns, fields, pastures	A
Verbesina helianthoides Crown Beard	Open woods, fields	C
Vernonia altissima Tall Ironweed	Open woods, fields	C
Vernonia missurica Ironweed	Open woods, fields	C
Vernonia texana Ironweed	Open woods, fields	C
Xanthium strumarium Cocklebur	Disturbed areas	C

Table D-2 (continued)

CONVOLVULACEAE		
Convolvulus arvensis Bindweed	Disturbed areas	C
Cuscuta campestris Dodder	Parasites of herbs	U
Ipomoea hederacea Ivy-leaved Morning Glory	Streambanks, fields and disturbed areas	C
Ipomoea lacunosa Common Morning Glory	Damp thickets and streambanks	C
Ipomoea pandurata Wild Potato	Thickets, fields and roadsides	C
Jacquemontia tamnifolia Smallflower Morning Glory	Disturbed areas	C
Dichondra repens Dichondra	Lawns, roadsides	C
CORNACEAE		
Cornus drummondii Roughleaf Dogwood	Streambanks, bottomlands	C
Cornus florida Flowering Dogwood	Uplands	C
Cornus foemina Stiff Dogwood	Low wet woodlands	U
Nyssa sylvatica Black Gum	Mixed woods	C
CRUCIFERAE		
Brassica campestris Field Mustard	Fields, waste places	C
Brassica kaber Charlock	Open areas, fields	C
Capsella bursa-pastoris Shepherd's Purse	Lawns, fields, roadsides	A
Cardamine hirsuta Bitter Cress	Moist open ground	C
Cardamine pensylvanica Bitter Cress	Moist open ground	C

Table D-2 (continued)

Descurainia pinnata Tansy Mustard	Disturbed areas	C
Draba brachycarpa Draba	Lawns, open areas	[illegible]
Lepidium virginicum Poor Man's Pepper Grass	Lawns, roadsides, open areas	[illegible]
Rorippa islandica Yellow Cress	Wet areas	[illegible]
Rorippa sessiliflora Yellow Cress	Wet areas	[illegible]
Sibara virginica Sibara	Old fields, roadsides	C
CUCURBITACEAE		
Cayaponia grandifolia Manso	River bottoms	R
Melothria pendula Creeping Cucumber	Moist rich woods	C
CUPRESSACEAE		
Juniperus virginana Red Cedar	Old fields, cultivated	C
CYPERACEAE		
Carex intumescens Sedge	Wet areas	C
Cyperus ovularis Sedge	Waste areas	C
Cyperus pseudovegetus Sedge	Urban areas	K
Cyperus rotundus Sedge	Urban areas	K
Eleocharis obtusa Spike-rush	Wet areas	C
Fimbristylis autumnalis Fimbristylis	Wet areas	C
Fimbristylis vahlii Fimbristylis	Wet areas	C

Table D-2 (continued)

<u>Fuirena simplex</u> Umbrella Grass	Wet areas	C
<u>Rhynchospora capitellata</u> False Bog Rush	Wet areas	C
<u>Rhynchospora macrostachya</u> Beakrush	Wet areas	C
DIOSCOREACEAE		
<u>Dioscorea batatas</u> Cinnamon Vine	Moist woods	K
<u>Dioscorea quaternata</u> Yam	Moist woods	C
EBENACEAE		
<u>Diospyros virginiana</u> Persimmon	Woods	C
EQUISETACEAE		
<u>Equisetum ferrissii</u> Smooth Scouring Rush	Streamsides	C
ERICACEAE		
<u>Lyonia ligustrina</u> He-Huckleberry	Rich moist woods	C
<u>Lyonia mariana</u> Stagger Bush	Rich moist woods	C
<u>Monotropa uniflora</u> Indian Pipe	Rich moist woods	U
<u>Rhododendron sp.</u> Azalea	Rich moist woods, open areas	U
<u>Vaccinium arboreum</u> Farkleberry	Rich moist woods	C
<u>Vaccinium elliottii</u> Mayberry	Rich moist woods	C
<u>Vaccinium stamineum</u> Deerberry	Rich moist woods	C
EUPHORBIACEAE		
<u>Acalypha gracilens</u> Three-seeded Mercury	Roadsides, fields, open areas	C

Table D-2 (continued)

Acalypha ostryaefolia Three-seeded Mercury	Roadsides, fields, open areas	C
Acalypha rhomboidea Three-seeded Mercury	Roadsides, fields, open areas	C
Croton capitatus Hogwort	Roadsides, fields, open areas	C
Croton glandulosus Croton	Roadsides, fields, open areas	C
Croton monanthogynus Goatweed	Roadsides, fields, open areas	C
Crotonopsis elliptica Rushfoil	Roadsides, fields, open areas	C
Euphorbia corollata Flowering Spurge	Roadsides, fields, open areas	C
Euphorbia heterophylla Painted-leaf	Roadsides, fields, open areas, urban areas	U
Euphorbia maculata Nodding Spurge	Roadsides, fields, open areas	C
Euphorbia supina Milk Purslane	Roadsides, fields, open areas	C
FAGACEAE		
Castanea pumila Chinquapin	Woodlands and thickets	U
Fagus grandifolia Beech	Upland woods	U
Quercus alba White Oak	Upland woods	C
Quercus falcata Southern Red Oak	Upland woods	A
Quercus marilandica Blackjack Oak	Upland areas	U
Quercus macrocarpa Bur Oak	Moist forests along streams	C
Quercus michauxii Basket Oak	Woods	U
Quercus nigra Water Oak	Streams	C

Table D-2 (continued)

Quercus phellos Willow Oak	Streams, wet areas	C
		U
Quercus rubra Northern Red Oak	Upland woods	U
Quercus stellata Post Oak	Upland woods	A
Quercus velutina Black Oak	Upland woods	C
Quercus shumardii Shumard Red Oak	Waterways	U
Quercus lyrata Overcup Oak	Moist forests along streams	C
GENTIANACEAE		
Sabatia angularis Rose Pink	Edge of upland woods	C
Sabatia brachiata Marsh Pink	Open moist areas	C
GERANIACEAE		
Geranium carolinianum Geranium	Dry woods, open areas	C
GRAMINEAE		
Agrostis hyemalis Hair Grass	Moist areas, roadsides	C
Andropogon gerardii Bluestem	Old fields, roadsides	C
Andropogon glomeratus Beard Grass	Old fields, roadsides	C
Andropogon virginicus Broom sedge	Old fields, roadsides	C
Aristida intermedia Three Awn Grass	Open areas, sandy soil	C
Aristida oligantha Three Awn Grass	Open areas, sandy soil	U
Aristida longespica Three Awn Grass	Open areas, sandy soil	C

Table D-2 (continued)

<u>Arundinaria</u> <u>gigantea</u> Cane	Wet areas	C
<u>Bromus</u> <u>racemosus</u> Brome Grass	Open areas, old fields	C
<u>Cenchrus</u> <u>incertus</u> Sandspurs	Disturbed areas	C
<u>Echinochloa</u> <u>crusgalli</u> Barnyard Grass	Lawns, roadsides	A
<u>Elymus</u> <u>canadensis</u> Wild Rye Grass	Old fields, open areas	C
<u>Eragrostis</u> <u>capillaris</u> Love Grass	Old fields, open areas	C
<u>Eragrostis</u> <u>hypnoides</u> Love Grass	Old fields, open areas	C
<u>Eragrostis</u> <u>pectinacea</u> Love Grass	Old fields, open areas	C
<u>Eragrostis</u> <u>oxylepis</u> Love Grass	Open areas, old fields	C
<u>Eragrostis</u> <u>spectablis</u> Love Grass	Open areas, old fields	C
<u>Erianthus</u> <u>alopecuroides</u> Beard Grass	Woodlands along stream courses	C
<u>Erianthus</u> <u>contortus</u> Beard Grass	Moist sandy areas	U
<u>Leersia</u> <u>oriyzoides</u> Cut Grass	Roadside ditches	K
<u>Leersia</u> <u>virginica</u> Cut Grass	Swampy areas	U
<u>Leptoloma</u> <u>cognatum</u> Witch Grass	Open areas, sandy soil	C
<u>Leptochloa</u> <u>fascicularis</u> Witch Grass	Open areas, sandy soil	C
<u>Leptochloa</u> <u>panicoides</u> Witch Grass	Open areas, sandy soil	C
<u>Leptochloa</u> <u>uninervia</u> Witch Grass	Open areas, sandy soil	K

Table D-2 (continued)

Oplismenus setarius Oplismenus	Woods, along streams	C
Panicum anceps Panic Grass	Well drained sites in uplands	C
Panicum angustifolium Panic Grass	Uplands	C
Panicum capillare Witch Grass	Disturbed areas	C
Panicum commutatum Panic Grass	Disturbed areas	C
Panicum dichotomiflorum Panic Grass	Moist disturbed areas along streams	C
Panicum hians Panic Grass	Moist areas	C
Panicum laxiflorum Panic Grass	Woods, sandy soil	C
Panicum polyanthes Panic Grass	Woods, sandy soil	U
Panicum scoparium Panic Grass	Moist woods, sandy soil	C
Panicum virgatum Panic Grass	Moist open areas	C
Paspalum floridanum Paspalum	Moist open areas	C
Paspalum laeve Paspalum	Open woods	U
Paspalum urvillei Vasey Grass	Moist disturbed areas	C
Setaria lutesens Foxtail Grass	Fields, open areas	C
Sorghum halepense Johnson Grass	Roadsides, disturbed areas	C
Sphenopholis obtusata Wedge Grass	Moist areas	C
Sporobolus asper Dropseed	Disturbed areas	C
Sporobolus cryptandrus Dropseed	Disturbed areas	A

Table D-2 (continued)

<u>Tripsacum dactyloides</u> Gamma Grass	Open areas	C
<u>Tridens flavus</u> Purple Top	Open forests, roadsides	C
<u>Tridens strictus</u> Tridens	Open forests, sandy soil	U
<u>Uniola latifolia</u> Uniola	Creek bottoms	C
<u>Uniola laxa</u> Uniola	Open areas, moist sandy soil	C
<u>Uniola sessiliflora</u> Uniola	Sandy woods	C
HAMAMELIDACEAE		
<u>Hamamelis virginiana</u> Witch Hazel	Stream borders	C
<u>Liquidambar stryraciflua</u> Sweet Gum	Upland and bottomland forests	A
HIPPOCASTANACEAE		
<u>Aesculus pavia</u> Red Buckeye	Open areas, forest edges	C
HYDROPHYLLACEAE		
<u>Hydrolea uniflora</u> Hydrolea	Edges of ponds and streams	C
<u>Phacelia ranunculacea</u> Phacelia	Moist woods	C
HYPERICACEAE		
<u>Ascyrum hypericoides</u> St. Andrew's Cross	Forests and open areas	C
<u>Ascyrum stans</u> St. Peter's-Wort	Wet woods	C
<u>Hypericum densiflorum</u> St. John's-Wort	Streams, pine forests	C
<u>Hypericum drummondii</u> St. John's-Wort	Old fields	C
<u>Hypericum mutilum</u> Dwarf St. John's-Wort	Edges of streams and swamps	C

Table D-2 (continued)

HYPERICACEAE (continued)		
Hypericum walteri St. John's-Wort	Edges of streams, swamps and ponds	C
IRIDACEAE		
Iris cristata Crested Iris	Streambanks, wet pastures	C
Sisyrinchium pruinosum Blue-eyed Grass	Open areas	C
JUGLANDACEAE		
Carya cordiformis Bitternut Hickory	Wet woods near streams	C
Carya illinoensis Pecan	Bottomlands near streams, cultivated	C
Carya ovalis Sweet Pignut Hickory	Woods near streams	C
Carya texana Black Hickory	Dry woods, sandy soil	C
Carya tomentosa Mockernut Hickory	Woods	C
Carya aquatica Water Hickory	Swamps, wet woods	C
Juglans nigra Black Walnut	Woodlands	C
JUNCACEAE		
Juncus scirpoides Rush	Stream edges, moist areas	C
LABIATAE		
Cunila origanoides Dittany	Dry woods	U
Hedeoma hispida Mock Pennyroyal	Old fields of uplands	C
Lamium amplexicaule Henbit Dead-Nettle	Lawns, open areas	C
Lamium purpureum Dead Nettle	Disturbed areas	C

Table D-2 (continued)

Lycopus rubellus Lycopus	Wet areas	C
Lycopus virginicus Bugle Weed	Wet areas of woodlands	C
Monarda citriodora Monarda	Open areas	C
Monarda fistulosa Wild Bergamot	Open woods, fields	C
Monarda punctata Spotted Monarda	Open areas, disturbed areas	C
Perilla frutescens Beef-steak Plant	Damp woods, stream borders	C
Prunella vulgaris Self-heal	Pastures, lawns, fields	C
Pycnanthemum albescens White Basil	Open woods along streams	U
Pycnanthemum muticum Mountain Mint	Dry open woods	U
Pycnanthemum tenuifolium Mountain Mint	Wet open areas	U
Salvia lyrata Cancerweed	Open areas	C
Scutellaria integrifolia Skullcap	Wood borders, stream edges	U
Scutellaria ovata Skullcap	Open wooded areas, roadsides	U
Stachys tenuifolia Hedge-Nettle	Open areas	C
Teucrium canadense Wood Sage	Open areas	C
Trichostema dichotomum Blue Curls	Dry open woods	U
LAURACEAE		
Lindera benzoin Spice Bush	Moist areas	C

Table D-2 (continued)

Sassafras albidum Sassafras	Dry uplands	C
LEGUMINOSAE		
Amorpha fruticosa False Indigo	Open areas	C
Amphicarpa bracteata Hog Peanut	Rich woods, moist areas	C
Apios americana Groundnut	Woods near streams	C
Baptisia leucantha Baptisia	Pine-oak woodlands	U
Baptisia sphaerocarpa Baptisia	Open areas	U
Cassia fasciculata Partridge Pea	Fields, open woods, roadsides	C
Cassia nictitans Sensitive Pea	Disturbed areas	C
Cercis canadensis Redbud	Woods	C
Centrosema virginianum Butterfly Pea	Open woods	C
Dalea lanata Wooley Dalea	Open sandy areas	R
Desmanthus illinoensis Prairie Mimosa	Open clayey soils	C
Desmodium ciliare Tick Trefoil	Dry sandy woods	C
Desmodium glutinosum Beggar's Ticks	Dry woods	U
Desmodium nudiflorum Beggar's Ticks	Woods	U
Desmodium nuttallii Beggar's Ticks	Dry sandy woods	C
Desmodium paniculatum Beggar's Ticks	Dry sandy woods	C

Table D-2 (continued)

Desmodium dillenii Beggar's Ticks	Dry sandy woods	C
Desmodium rigidum Beggar's Ticks	Dry sandy woods	C
Dioclea multiflora Dioclea	Along streams of uplands	U-R
Galactia volubilis Downey Milkpea	Woodlands	C
Gleditsia triacanthos Honey Locust	Open disturbed areas	C
Gymnocladus dioica Kentucky Coffee Tree	Cultivated, low rich woods	R
Lathyrus hirsutus Singletary Pea	Roadsides	U
Lathyrus latifolius Perennial Sweetpea	Cultivated, open woods	U
Lespedeza capitata Round-head Bush Clover	Open woodlands	U
Lespedeza cuneata Chinese Bush Clover	Sandy roadsides	U
Lespedeza hirta Hairy Bush Clover	Sandy woods	C
Lespedeza procumbens Trailing Bush Clover	Roadsides, open sandy woodlands	C
Lespedeza repens Creeping Bush Clover	Roadsides, open sandy woodlands	C
Lespedeza stuevei Tall Bush Clover	Dry woods	U-R
Lespedeza striata Japanese Bush Clover	Sandy open areas	C
Lespedeza stipulacea Korean Bush Clover	Sandy roadsides	C
Lespedeza virginica Slender Bush Clover	Roadsides, open sandy woodlands	C
Medicago lupulina Black Medick	Fields, open areas	C

Table D-2 (continued)

LEGUMINOSAE (continued)

Medicago sativa Alfalfa	Fields, open areas	C
Melilotus albus Bur Clover	Fields, open areas	C
Melilotus officinalis Bur Clover	Fields, open areas	C
Mimosa strigillosa Powderpuff	Open areas	C
Phaseolus polystachios Bean	Open areas	U-R
Pisum sativum Field Pea	Fields, cultivated, roadsides	C
Psoralea psoraliodes Sampson's Snakeroot	Sandy wooded areas	C
Rhynchosia latifolia Snoutbean	Sandy wooded areas	C
Robinia hispida Bristly Locust	Cultivated, woods edge	C
Robinia pseudoacacia Black Locust	Cultivated, open woods, roadsides	C
Schrankia uncinata Sensitive Brier	Open sandy soils	C
Sesbania exaltata Coffee Weed	Open sandy soils	C
Strophostyles helvola American Bean	Open sandy soils	U
Strophostyles pauciflora Fuzzy Bean	Open sandy soils	U
Strophostyles umbellata Fuzzy Bean	Sandy pine forests	C
Stylosanthes biflora Pencil Flower	Open areas	C
Tephrosia spicata Goat's Rue	Open areas, sandy soil	U

Table D-2 (continued)

Tephrosia virginiana Devil's Shoestring	Open areas, sandy soil	C
Trifolium arvense Rabbitfoot Clover	Lawns, fields, roadsides	C
Trifolium dubium Small Hop Clover	Lawns, fields, roadsides	C
Trifolium incarnatum Crimson Clover	Lawns, fields, roadsides	C
Trifolium campestre Low Hop Clover	Lawns, fields, roadsides	C
Trifolium reflexum Buffalo Clover	Lawns, fields, roadsides	C
Vicia dasycarpa Winter Vetch	Fields	C
Vicia sativa Common Vetch	Fields	C
LEITNERIACEAE		
Leitneria floridana Corkwood	Thickets	R (Threatened)
LEMNACEAE		
Lemna spp. Duckweed	Ponds, slow-moving streams	A
LENTIBULARIACEAE		
Utricularia gibba Bladderwort	Ponds	C
LILIACEAE		
Aletris farinosa Unicorn Root	Sand-gravel areas	U
Allium canadense Wild Onion	Open areas, fields	C
Allium vineale Field Garlic	Open areas, fields	C
Asparagus officinalis Asparagus	Open areas, fields	C

Table D-2 (continued)

Chamaelirium luteum Blazing Star	Cultivated, woods	R
Nothoscordum bivalve False Garlic	Open areas, fields, roadsides	C
LILIACEAE		
Smilacina racemosa False Soloman's Seal	Woods	C
Smilax bona-nox Catbrier	Woods	C
Smilax glauca Greenbrier	Woods	C
Smilax herbacea Greenbrier	Woods	C
Smilax rotundifolia Greenbrier	Woods	C
Trillium recurvatum Purple trillium	Upland woods	U
LINACEAE		
Linum medium Sucker Flax	Disturbed areas	C
LOGANIACEAE		
Gelsemium sempervirens Yellow Jessamine	Wooded areas	C
Polypremum procumbens Polypremum	Open areas, cultivated	C
LYTHRACEAE		
Ammania coccinea Tooth-cup	Mud of ponds and ditches	C
Lythrum lanceolatum Loosestrife	Open areas	C
MALVACEAE		
Abutilon theophrasti Indian Mallow	Fields, open areas	U
Hibiscus militaris Scarlet Rose-mallow	Open areas, streamsides	C

Table D-2 (continued)

Hibiscus trionum Flower-of-an-hour	Open areas, streamsides	C
Sida spinosa Prickly Mallow	Fields, open areas	C
Sida rhombifolia Axocatzin	Fields, open areas	C
MELASTOMATACEAE		
Rhexia mariana Meadow Beauty	Old fields	C
Rhexia virginica Meadow Beauty	Old fields	C
MELLACEAE		
Melia azedarach Chinaberry Tree	Bottomland woods	U
MENISPERMACEAE		
Cocculus carolinus Carolina Moonseed	Woods	C
MORACEAE		
Broussonetia papyrifera Paper Mulberry	Cultivated, roadsides	K
Maclura pomifera Osage Orange	Edge of fields, open areas	C
Morus rubra Red Mulberry	Woods	C
MYRICACEAE		
Movella cerifera Wax Myrtle	Bottomlands	C
NYMPHAEACEAE		
Brasenia schreberi Water Shield	Ponds, lakes	C
Nelumbo lutea American Lotus	Ponds, lakes	C
Nymphea odorata White Water Lily	Ponds, lakes	C

Table D-2 (continued)

OLEACEAE		
Chionanthus virginicus Fringe Tree	Old fields, cultivated, roadsides	C
Forestiera acuminata Swamp Privet	Bottomlands	U
Fraxinus pennsylvanica Green Ash	Bottomlands	C
Ligustrum vulgare Common Privet	Shaded woodlands	C
ONAGRACEAE		
Gaura coccinea Scarlet Gaura	Open disturbed areas, sandy soil	C
Gaura parviflora Gaura	Open disturbed areas, sandy soil	C
Ludwigia liptocarpa Water Primrose	Wet areas, ditches	C
Ludwigia peploides Water Primrose	Ponds and streams	C
Ludwigia alternifolia Seedbox	Ditches and wet areas	U
Ludwigia decurrens Primrose Willow	Swampy areas	C
Ludwigia glandulosa Cylindric-fruited Ludwigia	Swampy areas	C
Ludwigia linearis Water Primrose	Wet areas in pine forests	U
Oenothera biennis Common Evening Primrose	Woods and disturbed areas	C
Oenothera laciniata Cut-leaved Evening Primrose	Fields	C
Oenothera linifolia Three-leaved Sundrops	Open woods	C
Oenothera fruticosa Evening Primrose	Open areas	U
Oenothera rhombipetala Evening Primrose	Disturbed areas	C

Table D-2 (continued)

Oenothera speciosa Snowy Primrose	Roadsides, fields, open areas	A
OPHIOGLOSSACEAE		
Botrychium biternatum Grape Fern	Deep woods	U
ORCHIDACEAE		
Cypripedium calceolus Large Yellow Lady-slipper	Deep woods	R (Threatened)
Isotria verticillata Whorled Pogonia	Stream borders of uplands	U
Spiranthes vernalis Ladies' Tresses	Bottomlands	C
Tipularia discolor Crane-fly Orchid	Streams of pine-hardwoods	U
OSMUNDACEAE		
Osmunda cinnamomea Cinnamon Fern	Deep wet woods	C
Osmunda regalis Royal Fern	Deep wet woods	C
OXALIDACEAE		
Oxalis dillenii Wood Sorrel	Open areas, fields, lawns	C
Oxalis repens Creeping Wood Sorrel	Open areas, fields, lawns	C
Oxalis violacea Wood Sorrel	Open areas, fields, lawns	C
PASSIFLORACEAE		
Passiflora incarnata Passion Flower	Fences, open disturbed areas	C
Passiflora lutea Passion Flower	Fields	C
PHRYMACEAE		
Phryma leptostachya Lopseed	Woodlands and thickets	U

Table D-2 (continued)

PINACEAE		
Pinus echinata Shortleaf Pine	Upland woods	A
Pinus taeda Loblolly Pine	Upland woods	A
PLANTAGINACEAE		
Plantago aristata Buckthorn	Lawns, fields	C
Plantago lanceolata English Plantain	Lawns, fields	C
Plantago rugelii Plantain	Lawns, fields	C
Plantago virginica Pale-seeded Plantain	Lawns, fields	C
PLATANACEAE		
Platanus occidentalis Sycamore	Streamsides, low woods, cultivated	C
POLEMONIACEAE		
Phlox glaberrima Phlox	Fields, roadsides	C
Phlox pilosa Phlox	Fields, roadsides	C
POLYGALACEAE		
Polygala sanguinea Milkwort	Moist open woods	C
POLYGONACEAE		
Brunnichia cirrhosa Ladies' Eardrops	Edge of ponds and streams, low woods	C
Polygonum hydropiper Water Pepper	Wet areas	C
Polygonum hydropiperoides Wild Water Pepper	Wet areas	C
Polygonum lapathifolia Smartweed	Wet disturbed areas	C
Polygonum pensylvanica Pinkweed	Wet disturbed areas	C

Table D-2 (continued)

Polygonum persicaria Lady's Thumb	Wet areas	C
Polygonum punctata Water Smartweed	Wet areas	C
Polygonum aviculare Smartweed	Wet areas	C
Polygonum virginianum Virginia Knotweed	Woodlands	C
Rumex crispus Sour Dock	Lawns, disturbed areas	C
Rumex hastatulus Wild Sorrel	Fields	C
Rumex verticillatus Dock	Fields	C
POLYPODIACEAE		
Asplenium platyneuron Ebony Spleenwort	Rich woods	C
Athyrium filix-femina Lady Fern	Rich woods	C
Polypodium polypodioides Resurrection Fern	Large oaks	C
Polystichum acrostichoides Christmas Fern	Along streams of rich woods	C
Pteridium aquilinum Bracken Fern	Open areas, edge of woods	C
Woodsia obtusa Blunt-lobed Woodsia	Rich woods	U
Woodwardia areolata Netted Chain Fern	Rich woods	U
Woodwardia virginica Virginia Chain Fern	Rich woods	U
PORTULACACEAE		
Claytonia virginica Spring Beauty	Lawns, open areas	A
Portulaca oleracea Purslane	Open areas, roadsides	C

Table D-2 (continued)

PRIMULACEAE		
Lysimachia radicans Loosestrife	Open woods	C
RANUNCULACEAE		
Anemone virginiana Thimbleweed	Sandy wooded areas	C
Clematis crispa Swamp Leather Flower	Along streams of bottomland forests	C
Clematis dioscoreifolia Leather Flower	Woods, fence rows	C
Clematis pitcheri Leather Flower	Woods and thickets	C
Clematis virginiana Virgin s Bower	Edges of bottomland forests	C
Ranunculus abortivus Small-flowered Crowfoot	Moist ground, open areas	C
Ranunculus bulbosus Hispid Buttercup	Lawns, open areas	C
Ranunculus sardous Buttercup	Moist areas	U
Ranunculus sceleratus Buttercup	Stream and lake borders	C
Ranunculus septentrionalis Swamp Buttercup	Swamps	U
RHAMNACEAE		
Berchemia scandens Rattan Vine	Woods	C
Ceanothus americanus New Jersey Tea	Forest clearings	C
ROSACEAE		
Agrimonia rostellata Agrimony	Moist rich open woods	C
Amelanchier arborea Service Berry	Fence rows, field edges	C
Crataegus marshallii Parsley Hawthorn	Fence rows, field edges	C

Table D-2 (continued)

Crataegus nitida Hawthorn	Fence rows, field edges	C
Crataegus viridis Green Hawthorn	Fence rows, field edges	C
Duchesnea indica Indian Strawberry	Wet woods, thickets	C
Geum canadense White Avens	Rich woods	U
Gillenia stipulata American Ipecac	Woods and thickets	C
Potentilla simplex Old Field Cinquefoil	Woodlands	C
Prunus americana Wild Plum	Cultivated, roadsides, woods edge	C
Prunus angustifolia Chickasaw Plum	Old fields, woods edge	C
Prunus serotina Black Cherry	Woods	C
Prunus umbellata Flatwood Plum	Fence rows, streamsides	C
Aronia arbutifolia Red Chokeberry	Bottomland thickets	K
Rosa cathayensis Rose	Woods edge, roadsides	U
Rosa multiflora Japanese Rose	Open woods, thickets, waste areas	U
Rosa setigera Prairie Rose	Open woods, thickets	C
Rubus argutus High Bush Blackberry	Fields, forest edges	C
Rubus flagellaris Northern Dewberry	Fields, forest edges	C
Rubus procerus Himalaya Berry	Fields, forest edges	C
Rubus trivialis Southern Dewberry	Fields, forest edges	C

Table D-2 (continued)

RUBIACEAE		
Cephalanthus occidentalis Buttonbush	Streamsides, lake shores	A
Diodia teres Rough Buttonweed	Sandy woodlands	C
Diodia virginiana Buttonweed	Swamps, streams	C
Galium aparine Cleavers	Disturbed areas, lawns	C
Galium circaezans Woods Bedstraw	Dry rich woods	U
Galium obtusum Bluntleaf Bedstraw	Wet woods	C
Galium uniflorum Bedstraw	Wet woods	K
Hedyotis australis Bluets	Lawns, open areas, fields	C
Hedyotis caerulea Bluets	Lawns, open areas, fields	C
Hedyotis purpurea Bluets	Lawns, open areas, fields	C
Hedyotis crassifolia Bluets	Lawns, open areas, fields	C
Mitchella repens Partridge Berry	Woods	U
Sherardia arvensis Field Madder	Fields, roadsides	C
Spermacoce glabra Smooth Buttonweed	Bottomlands	C
RUTACEAE		
Zanthoxylum clava-herculis Hercules'-club	Sandy soils	U
SALICACEAE		
Populus alba Silver Poplar	Cultivated, roadsides	U

Table D-2 (continued)

Populus deltoides Cottonwood	Watercourses	C
Populus grandidentata Large-toothed Aspen	Cultivated, water courses	U
Salix interior Sandbar Willow	Sandbars	K
Salix nigra Black Willow	Streambeds, wet fields	C
SAPINDACEAE		
Cardiospermum halicababum Balloon Vine	Open disturbed areas and brushy areas	C
SAPOTACEAE		
Bumelia lanuginosa Chittimwood	Upland areas	U
SAURURACEAE		
Saururus cernuus Lizard's Tail	Backwater areas, stream and lake borders	C
SAXIFRAGACEAE		
Penthorum sedoides Ditch Stonecrop	Wet areas, stream and lake borders	U
SCROPHULARIACEAE		
Gerardia aspera Gerardia	Dry forest and clearing	U
Gerardia fasciculata Gerardia	Open weedy areas	C
Gerardia gattingeri Gerardia	Open woodlands	U
Gerardia heterophylla Prairie Gerardia	Old fields	C
Gerardia tenuifolia Gerardia	Along ponds and streams	C
Gratiola neglecta Clammy Hedge Hyssop	Along ponds and streams of woods	C
Gratiola pilosa Hedge Hyssop	Backwater areas and bottomlands	C

Table D-2 (continued)

Conobea multifida Conobea	Upland streams	C
Linaria canadensis Blue Toadflax	Grassey areas in open woodlands, roadsides	C
Lindernia dubia False Pimpernel	Backwater areas and stream borders	C
Mazus japonicus Mazus	Roadsides, open areas, lawns	K
Bacopa acuminata Water Hyssop	Ditches, backwater areas, ponds	C
Mimulus alatus Monkey Flower	Wooded streams	C
Pedicularis canadensis Lousewort	Edge of upland forests, seepage slopes	C
Penstemon alluviorum Beard-Tongue	Open areas, alluvial soils	U
Penstemon arkansanus Beard-Tongue	Upland woods	U
Penstemon laxiflorus Beard-Tongue	Upland woods	U
Verbascum thapsus Mullein	Roadsides, open areas, disturbed areas	C
Verbascum blattaria Moth Mullein	Roadsides, open areas, disturbed areas	U
Veronica arvensis Corn Speedwell	Open wooded slopes; fields	C
Veronica peregrina Neckweed	Streams, backwater areas	C
SOLANACEAE		
Datura innoxia Indian Apple	Dry rocky streambeds	U
Physalis angulata Ground Cherry	Open woods, disturbed areas	C
Physalis virginiana Ground Cherry	Old fields, disturbed areas	C

Table D-2 (continued)

Physalis viscosa Ground Cherry	In and near woods	C
Solanum americanum Black Night Shade	Dry open woods, thickets	C
Solanum carolinense Horse-nettle	Fields and disturbed areas	C
Solanum elaeagnifolium Silver-leaf Nightshade	Disturbed areas, roadsides	C
Solanum rostratum Buffalo Bur	Disturbed areas, roadsides	C
SYMPLOCACEAE		
Symplocos tinctoria Horse-sugar	Bottomlands and wet woods	C
TAMARICACEAE		
Tamarix gallica Salt Cedar	Alluvial stream courses, cultivated	U
TAXODIACEAE		
Taxodium distichum Baldcypress	Swampy areas, standing water	C
TILIACEAE		
Tilia caroliniana Carolina Basswood	Upland woodlands along streams	U
TYPHACEAE		
Typha angustifolia Cattail	Wet areas	C
ULMACEAE		
Celtis Laevigata Southern Hackberry	Bottomlands, wet woods	C
Planera aquatica Water Elm	Water courses	K
Ulmus alata Winged Elm	Woods	C
Ulmus americana American Elm	Woods	C

Table D-2 (continued)

Ulmus crassifolia Cedar Elm	Uplands near streams	C
UMBELLIFERAE		
Chaerophyllum tainturieri Chervil	Dry woods and thickets	C
Cicuta maculata Spotted Cowbane	Streams and wet areas	C
Crytotaenia canadensis Honewort	Moist upland areas	C
Daucus carota Wild Carrot	Disturbed areas	C
Daucus pusillus Rattlesnake-weed	Disturbed areas	C
Eryngium yuccifolium Button Snakeroot	Fields	C
Hydrocotyle verticillata Pennywort	Wet woods, wet areas	C
Oxypolis rigidior Oxypolis	Bottomlands	C
Ptilimnium nuttallii Mock Bishop's Weed	Moist areas of fields and open areas	C
Sanicula canadensis Black Snakeroot	Moist woods	C
Thaspium trifoliatum Meadow Parsnip	Fields	U
Torilis japonica Torilis	Bottomlands, wet woods	C
Trepocarpus aethusae Trepocarpus	Bottomlands	U
Zizia aurea Golden Alexander	Bottomlands and sandy woods	C
URTICACEAE		
Urtica chamaedryoides Nettle	Open woods, disturbed areas	C
Boehmeria cylindrica False Nettle	Wet areas, backwaters and streambanks	C

Table D-2 (continued)

VALERIANACEAE		
<u>Valerianella radiata</u> Corn Salad	Roadsides, open areas	C
VERBENACEAE		
<u>Callicarpa americana</u> French Mulberry	Bottomlands, wet woods	C
<u>Lippia lanceolata</u> Fog Fruit	Wet areas, streambanks	C
<u>Lippia nodiflora</u> Fog Fruit	Wet areas, streambanks	C
<u>Verbena bonariensis</u> Vervain	Rice field edges, wet areas	U
<u>Verbena brasiliensis</u> Brasilian Vervain	Roadsides, open areas, disturbed areas	A
<u>Verbena canadensis</u> Rose Verbena	Roadsides, fields, open areas	C
<u>Verbena halei</u> Vervain	Fields, pastures, open areas	C
<u>Verbena rigida</u> Vervain	Roadsides and fields	C
<u>Verbena stricta</u> Vervain	Roadsides, disturbed areas	C
<u>Verbena urticifolia</u> Vervain	Bottomlands, disturbed areas	C
VIOLACEAE		
<u>Viola lanceolata</u> Violet	Roadside ditches, wet fields	C
<u>Viola missouriensis</u> Missouri Violet	Bottomlands	C
<u>Viola pratincola</u> Common Violet	Lawns, roadsides, fields	C
<u>Viola rafinesquii</u> Johnny-jump-up	Lawns, roadsides, fields	C
<u>Viola sagittata</u> Arrow-leaved Violet	Dry wood edges	C

Table D-2 (continued)

Viola triloba Three-lobed Violet	Wet woods, bottomlands	C
VITACEAE		
Ampelopsis arborea Peppervine	Uplands forests	A
Ampelopsis cordata Raccoon Grape	Uplands forests	A
Parthenocissus quinquefolia Virginia Creeper	Uplands forests	A
Vitis aestivalis Summer Grape	Streambanks of wooded areas	C
Vitis cinerea Grayback Grape	Bottomlands	C
Vitis vulpina Frost Grape	Open woods along upland streams	C

*This list of vascular plants, compiled by VTN Louisiana, is based largely on a personal collection (of non-cultivated plants) of Mrs. Marie Locke, a Pine Bluff amateur botanist. Many of Mrs. Locke's identifications were confirmed by Dr. Edwin B. Smith, Professor of Botany and Director of the Herbarium at the University of Arkansas, Fayetteville. This list also incorporates plants from collections and observations of the VTN field team. This is the most complete list of vascular plants compiled for Jefferson County, Arkansas, to date.

** A - Abundant
C - Common
U - Uncommon
R - Rare
K - Unknown

Table D-3
Zooplankton of the Pine Bluff Study Area Stations*

STATION NO.	TAXON	RELATIVE ABUNDANCE
1	Cyclopoid copepods	Infrequent
	Chironomid larvae	Infrequent
	Nauplii	Infrequent
	Nematodes	Infrequent
	Ostracods	Rare
2	Rotifers	Infrequent
	Nauplii	Infrequent
	Oligochaetes	Rare
	Copepods	Infrequent
	Nematodes	Rare
3	Nauplii	Infrequent
	Rotifers	Infrequent
	Copepods	Infrequent
	Cladocerans	Infrequent
4	Nauplii	Infrequent
	Rotifers	Infrequent
	Copepods	Rare
5	Cladocerans	Infrequent
	Rotifers	Infrequent
	Nauplii	Infrequent
	Chironomids	Rare
7	Copepods	Frequent
	Nauplii	Frequent
	Ostracods	Frequent
	Rotifers	Infrequent
	Cladocerans	Rare
9a	Rotifers	Very Abundant
	Cladocerans	Abundant
	Nauplii	Abundant
	Copepods	Frequent
10b	Cladocerans	Abundant
	Cyclopoid copepods	Frequent
	Nauplii	Frequent
	Rotifers	Frequent

* This list represents only the larger predominant taxa present at the Study Area stations. It is the only list of zooplankton from these areas.

Table D-4
Benthic Invertebrates of the Pine Bluff Study Area Stations*
(April and November, 1974)

COELENTERATA
- *Hydra* sp.
- *Hydra americana*

NEMATOMORPHA

PLATYHELMINTHES
- *Dugesia tigrina*

ANNELIDA
- Oligochaeta
  - *Aeolosoma* sp.
  - Naididae
  - *Chaetogaster* sp.
  - *Ophidonais* sp.
  - *Dero* sp.
  - *Pristina* sp.
  - *Naidium* sp.
  - *Nais* sp.
  - *Stylaria* sp.
  - Tubidicidae
  - *Tubifex* sp.
  - *Limnodrilus* sp.
  - *Limnodrilus cervix*
  - *Branchiura sowerbyi*
  - *Lumbriculidae* #1
  - *Lumbriculidae* #2
  - *Lumbriculus* sp.
  - *Lumbriculus inconstans*
  - *Cambarincola* sp.
- Hirudinea
  - *Helobdella* sp.
  - *Helobdella elongata*
  - *Helobdella lineata*
  - *Helobdella stagnalis*
  - *Placobdella* sp.
  - *Placobdella parasitica*
  - *Mooreobdella microstoma*

ARTHROPODA
- Crustacea
  - *Branchinecta* sp.
  - Cladocera
  - Copepoda
  - *Diaptomus* sp.
  - Cyclopoida
  - *Asellus militaris*
  - *Hyalella azteca*
  - Astacidae
  - *Procambarus* sp.
  - *Procambarus simulans*

INSECTA
- Ephemeroptera
  - *Hexagenia* sp.
  - *Oreianthus* sp.
  - *Potamanthus* sp.
  - *Caenis* sp.
  - *Baetis* sp.
  - *Ephemerella* sp.
- Odonata
  - *Macromia* sp.
  - *Libellula* sp.
  - *Cannacria gravida*
  - *Somatochlora* sp.
- Coleoptera
  - *Haliplus* sp.
  - *Bidessus* sp.
  - *Hydrobius* sp.
- Diptera
  - *Chaoborus* sp.
  - *Simulium* sp.
  - Tanypodini
  - *Tanypus* sp.
  - *Pentaneura* sp.
  - *Procladius* sp.
  - *Coelotanypus* sp.
  - Chironomini
  - *Chironomus* sp.
  - *Cryptochironomus* sp.
  - *Parachironomus* sp.
  - *Glyptotendipes* sp.
  - *Paralauterborniella* sp.
  - *Einfeldia* sp.
  - *Dicrotendipes* sp.
  - Unidentified pupae

MOLLUSCA
- Gastropoda
  - *Physa* sp.
  - *Lymnaea* sp.
- Pelecypoda
  - Unionidae
  - *Arcidens confragosus*
  - *Sphaerium* sp.
  - *Sphaerium transversum*

* For abundance and distribution see Tables D-5 through D-12.

Table D-5

Total Taxa, Numbers of Individuals and Biomass of Benthos: Station 1, April and November, 1974

TAXA	NO. OF INDIVIDUALS/m^2 (APRIL/NOVEMBER)	BIOMASS IN g/m^2 (APRIL/NOVEMBER)
Dero sp.	6/395	0.06/0.10
Stylaria sp.	0/73	0/0.03
Aeolosoma sp.	0/217	0.0.06
Lumbriculidae #1	33/0	1.71/0
Lumbriculidae #2	6/0	0.06/0
Lumbriculus sp.	4/0	0.33/0
Nematomorpha	0/16	0/< 0.01
Helobdella sp.	0/3	0/0.03
Branchinecta sp.	0/249	0/0.16
Diaptomus sp.	11/0	0.06/0
Asellus militaris	16/0	0.11/0
Hyalella azteca	16/6	0.06/0.02
Cyclopoida	0/19	0/< 0.01
Cladocera	0/54	0/< 0.01
Astacidae	0/3	0/0.61
Procambarus sp.	6/0	4.40/0
Oreianthus sp.	2/0	0.11/0
Potamanthus sp.	6/0	0.06/0
Baetis sp.	6/0	0.06/0
Ephemerella sp.	0/13	0/0.06
Somatochlora sp.	0/6	0/0.57
Macromia sp.	11/0	0.55/0
Libellula sp.	16/0	2.75/0
Haliplus sp.	6/0	0.11/0
Bidessus sp.	6/0	0.11/0
Hydrobius sp.	16/0	0.28/0
Cannacria gravida	6/0	1.38/0
Chaoborus sp.	6/0	0.06/0
Tanypus sp.	280/0	1.05/0
Pentaneura sp.	187/0	0.77/0
Chironomini	171/0	0.72/0
Chironomus sp.	0/35	0/0.06
Parachironomus sp.	39/0	0/0.28
Einfeldia sp.	0/22	0/0.03
Dicrotendipes sp.	0/131	0/0.16
Unidentified dipteran pupae	11/0	0.16/0
Sphaerium sp.	6/0	0.06/0
Sphaerium transversum	6/13	3.36/0.10
Arcidens confragosus	0/3	0/0.26
TOTALS: 25/17	933/1,258	18.66/2.25

Table D-6

Total Taxa, Numbers of Individuals and Biomass of Benthos: Station 2, April and November, 1974

TAXA	NO. OF INDIVIDUALS/m^2 (APRIL/NOVEMBER)	BIOMASS IN g/m^2 (APRIL/NOVEMBER)
Hydra sp.	11/0	0.06/0
Naididae	0/10	0/0.02
Dero sp.	638/268	5.28/0.35
Limnodrilus sp.	7,799/5,825	54.84/14.37
Limnodrilus cervis	6/0	0.06/0
Lumbriculidae	22/0	0.22/0
Lumbriculus inconstans	1,326/19	86.52/1.01
Diaptomus sp.	16/0	0.06/0
Branchinecta sp.	0/10	0/0.01
Hyalella azteca	77/0	0.26/0
Libellula sp.	33/0	0.83/0
Chaoborus sp.	50/0	0.11/0
Procladius sp.	0/61	0/0.15
Tanypus sp.	154/0	1.98/0
Chironomini	39/0	0.11/0
Unidentified dipteran pupae	11/0	0.11/0
TOTALS: 13/6	10,182/6,199	150.44/16/31

Table D-7

Total Taxa, Numbers of Individuals and Biomass of Benthos: Station 3, April and November, 1974

TAXA		NO. OF INDIVIDUALS/m^2 (APRIL/NOVEMBER)	BIOMASS IN g/m^2 (APRIL/NOVEMBER)
Hydra sp.		6/0	0.06/0
Nematomorpha		11/73	0.06/0.01
Dugesia tigrina		0/6	0/< 0.01
Naidium sp.		11/0	0.06/0
Dero sp.		0/45	0/0.01
Tubifex sp.		143/0	1.38/0
Limnodrilus sp.		501/568	2.48/6.30
Helobdella lineata		94/101	0.22/0.96
Helobdella stagnalis		16/6	0.33/0.11
Helobdella elongata		264/0	6.60/0
Placobdella sp.		0/11	0/0.84
Placobdella parasitica		6/0	0.11/0
Mooreobdella microstoma		6/6	0.06/0.06
Branchinecta sp.		39/22	0.16/0.02
Hyalella azteca		16/45	0.22/0.11
Potamanthus sp.		0/11	0/0.01
Baetis sp.		6/0	0.28/0
Macromia sp.		6/0	0.83/0
Chaoborus sp.		22/0	0.06/0
Tanypus sp.		66/34	0.22/0.11
Procladius sp.		0/28	0/0.06
Chironomini		143/0	0.50/0
Chironomus sp.		193/56	0.72/0.34
Cryptochironomus sp.		11/84	0.06/0.11
Einfeldia sp.		0/96	0/0.11
Sphaerium sp.		0/17	0/0.62
Sphaerium transversum		6/0	1.65/0
TOTALS:	20/17	1,566/1,209	16.06/9.77

Table D-8

Total Taxa, Numbers of Individuals and Biomass of Benthos: Station 4, April and November, 1974

TAXA		NO. OF INDIVIDUALS/m^2 (APRIL/NOVEMBER)	BIOMASS IN g/m^2 (APRIL/NOVEMBER)
Limnodrilus sp.		59,593/18,611	352.65/49.02
Lumbriculidae		0/425	0/3.72
Helobdella sp.		138/0	0.50/0
Helobdella lineata		0/226	0/30.55
Placobdella multilineata		0/146	0/14.61
Chironomus sp.		193/0	1.32/0
Lymnaea sp.		22/0	1.32/0
Sphaerium transversum		8,245/1,541	163.35/130.18
TOTALS:	5/5	68,191/20,949	529.99/228.08

Table D-9

Total Taxa, Numbers of Individuals and Biomass of Benthos: Station 5, April and November, 1974

TAXA		NO. OF INDIVIDUALS/m^2 (APRIL/NOVEMBER)	BIOMASS IN g/m^2 (APRIL/NOVEMBER)
Nematomorpha		0/10	0/< 0.01
Naididae		0/118	0/1.13
Pristina sp.		0/341	0/0.41
Ophidonais sp.		0/210	0/0.26
Nais sp.		61/0	0.77/0
Dero sp.		2,585/0	10.51/0
Limnodrilus sp.		8,509/1,027	37.57/1.24
Helobdella sp.		28/0	0.66/0
Helobdella lineata		28/6	0.11/0.10
Placobdella sp.		0/10	0/0.10
Branchinecta sp.		0/19	0/0.01
Hyalella azteca		0/13	0/0.03
Asellus militaris		16/3	0.11/0.01
Diaptomus sp.		16/0	0.06/0
Macromia sp.		6/0	0.61/0
Hexagenia sp.		319/6	3.69/0.01
Hydrobius sp.		0/3	0/0.10
Caenis sp.		0/26	0/0.06
Chaoborus sp.		33/0	0.06/0
Procladius sp.		28/51	0.11/0.10
Tanypus sp.		116/26	0.11/0.06
Chironomini		16/0	0.06/0
Chironomus sp.		55/10	0.22/0.02
Cryptochironomus sp.		160/0	0.50/0
Sphaerium transversum		297/83	30.03/1.31
Arcidens confragosus		6/0	3.85/0
TOTALS:	17/17	12,279/1,962	89.25/3.95

Table D-10
Total Taxa, Numbers of Individuals and Biomass of Benthos:
Station 7, April and November, 1974

TAXA		NO. OF INDIVIDUALS/m^2 (APRIL/NOVEMBER)	BIOMASS IN g/m^2 (APRIL/NOVEMBER)
Dero sp.		39/16	0.11/0.02
Limnodrilus sp.		968/89	2.09/0.06
Limnodrilus cervix		61/0	0.39/0
Lumbriculidae		28/0	0.06/0
Cambarincola sp.		193/0	0.28/0
Helobdella sp.		0/6	0/0.35
Branchinecta sp.		72/112	0.83/0.13
Hyalella azteca		44/99	0.06/0.29
Astacidae		0/41	0/5.74
Procambarus simulans		6/0	33.28/0
Haliplus sp.		0/3	0/0.03
Chaoborus sp.		33/0	0.55/0
Tanypus sp.		50/0	0.16/0
Chironomini		88/0	0.22/0
Chironomus sp.		154/0	0.88/0
Parachironomus sp.		83/0	0.16/0
Procladius sp.		55/0	0.11/0
Dicrotendipes sp.		0/67	0/0.06
Glyptotendipes sp.		0/35	0/0.06
Unidentified dipteran pupae		495/252	15.17/16.26
TOTALS:	15/11	2,369/723	54.25/23/16

Table D-11

Total Taxa, Numbers of Individuals and Biomass of Benthos: Station 9a, April and November, 1974

TAXA		NO. OF INDIVIDUALS/m^2 (APRIL/NOVEMBER)	BIOMASS IN g/m^2 (APRIL/NOVEMBER)
Nematomorpha		6/0	0.06/0
Naididae		11/125	0.06/0.31
Nais sp.		22/0	0.11/0
Dero sp.		924/1,344	0.77/0.94
Limnodrilus sp.		7,469/42,134	50.77/116.59
Branchiura sowerbyi		11/0	0.61/0
Tubifex sp.		16/0	0.11/0
Lumbriculidae		6/0	0.28/0
Placobdella sp.		0/31	0/0.31
Placobdella parasitica		6/0	0.22/0
Helobdella stagnalis		39/0	0.28/0
Helobdella lineata		0/63	0/0.63
Branchinecta sp.		72/63	0.22/0.06
Tanypus sp.		50/94	0.28/0.63
Chironomus sp.		143/188	1.10/0.31
Procladius sp.		0/63	0/0.16
TOTALS:	13/9	8,775/44,105	55.31/119.94

Table D-12

Total Taxa, Numbers of Individuals and Biomass of Benthos:
Station 10b, April and November, 1974

TAXA	NO. OF INDIVIDUALS/m^2 (APRIL/NOVEMBER)	BIOMASS IN g/m^2 (APRIL/NOVEMBER)
Hydra americana	11/0	0.06/0
Pristina sp.	6/19	0.11/0.03
Dero sp.	61/548	0.77/0.77
Chaetogaster sp.	127/0	0.88/0
Stylaria sp.	0/13	0/0.01
Naididae	0/38	0/0.03
Naidium sp.	0/86	0/0.22
Limnodrilus sp.	1,188/902	7.70/2.71
Limnodrilus cervix	16/0	0.11/0
Lumbriculidae	22/0	0.11/0
Branchinecta sp.	66/1.66	0.22/0.29
Copepoda	0/6	0/< 0.01
Diaptomus sp.	66/0	0.22/0
Hyalella azteca	16/0	0.06/0
Chaoborus sp.	22/0	0.16/0
Simulium sp.	6/0	0.11/0
Tanypodini	16/0	0.06/0
Tanypus sp.	149/0	0.88/0
Coelotanypus sp.	39/48	0.33/0.06
Chironomini	77/0	0.33/0
Chironomus sp.	77/239	0.50/0.41
Cryptochironomus sp.	22/70	0.22/0.13
Glyptotendipes	6/26	0.06/0.06
Paralauterborniella sp.	11/22	0.06/0.03
Parachironomus sp.	0/26	0/0.03
Unionidae	11/0	0.33/0
Sphaerium sp.	11/6	0.06/0.13
Sphaerium transversum	39/0	1.05/0
TOTALS: 23/16	2,065/2,225	4.94/14.23

Table D-13

Epibenthos of the Pine Bluff Study Area Stations*
(April and November, 1974)

ANNELIDA
- Oligochaeta
  - Limnodrilus sp.
- Hirudinea
  - Helobdella sp.
  - Helobdella stagnalis
  - Placobdella sp.
  - Placobdella parasitica
  - Mooreobdella microstoma
  - Haemopis sp.

ARTHROPODA
- Crustacea
  - Branchinecta sp.
  - Hyalella azteca
  - Asellus militaris
  - Astacidae
  - Procambrus sp.
  - Procambarus clarki
  - Procambarus simulans
  - Palaemonetes kadiakensis
- Insecta
- Ephemeroptera
  - Isonychia sp.
  - Oreianthus sp.
- Odonata
  - Macromia sp.
  - Argia sp.
  - Ischnura sp.
- Hemiptera
  - Gerris sp.
  - Notonectidae
  - Ranatra sp.
  - Corixidae
- Coleoptera
  - Gyrinidae
  - Gyrinus sp.
  - Hydrophilidae
- Diptera
  - Chaoborus sp.
  - Simulium sp.
  - Chironomidae
  - Tanypus sp.
  - Eukiefferiella sp.
  - Chironomus sp.
  - Dicrotendipes sp.

MOLLUSCA
- Gastropoda
  - Physa sp.
  - Lymnaeidae
- Pelecypoda
  - Sphaerium sp.

CHORDATA
- Amphibia
  - Rana sp.
- Pisces
  - Esox americanus
  - Notropis antherinoides
  - Gambusia affinis
  - Aphredoderus sayanus
  - Lepomis sp.
  - Lepomis macrochirus
  - Etheostoma gracile
  - Etheostoma proelaire

* For abundance and distribution see Tables D-14 through D-21.

Table D-14

Epibenthic Catch Per Effort: Station 1, April and November, 1974

TAXA		NO. OF INDIVIDUALS PER EFFORT (APRIL/NOVEMBER)
ARTHROPODA		
Insecta		
Corixidae		1/0
Dipteran pupae		0/1
Dicrotendipes sp.		0/93
Crustacea		
Branchinecta sp.		0/2
Hyalella azteca		0/6
Asellus militaris		0/2
Astacidae		0/2
Palaemonetes kadiakensis		0/3
TOTALS:	1/7	1/109

Table D-15

Epibenthic Catch Per Effort: Station 2, April and November, 1974

TAXA	NO. OF INDIVIDUALS PER EFFORT (APRIL/NOVEMBER)
ARTHROPODA	
Insecta	
Argia sp.	0/1
Ischnura sp.	1/8
Eukiefferiella sp.	2/0
Hydrophilidae	0/1
Notonectidae	0/3
Crustacea	
Asellus militaris	0/1
Astacidae	0/1
MOLLUSCA	
Gastropoda	
Physa sp.	0/8
TOTALS: 2/7	3/23

Table D-16

Epibenthic Catch Per Effort: Station 3, April and November, 1974

TAXA		NO. OF INDIVIDUALS PER EFFORT (APRIL/NOVEMBER)
ANNELIDA		
Hirudinea		
Helobdella sp.		0/1
ARTHROPODA		
Crustacea		
Palaemonetes kadiakensis		26/20
Astacidae		0/17
Hyalella azteca		0/5
Asellus militaris		0/1
Insecta		
Chironomidae		0/22
Notonectidae		0/2
Gerris sp.		1/0
Ranatra sp.		1/0
TOTALS:	3/7	28/68

Table D-17
Epibenthic Catch Per Effort: Station 4, April and November, 1974

TAXA	NO. OF INDIVIDUALS PER EFFORT (APRIL/NOVEMBER)
ANNELIDA	
Hirudinea	
Placobdella sp.	0/2
Placobdella parasitica	1/0
Helobdella elongata	2/0
ANTHROPODA	
Crustacea	
Palaemonetes kadiakensis	10/0
Astacidae	0/1
Insecta	
Gyrinus sp.	1/0
Gyrinidae larvae	0/1
MOLLUSCA	
Gastropoda	
Physa sp.	4/65
TOTALS: 5/4	18/69

Table D-18

Epibenthic Catch Per Effort: Station 5, April and November, 1974

TAXA		NO. OF INDIVIDUALS PER EFFORT (APRIL/NOVEMBER)
ARTHROPODA		
Crustacea		
Procambarus clarki		2/0
Procambarus simulans		1/0
Astacidae		0/6
Palaemonetes kadiakensis		6/21
Asellus militaris		0/1
Insecta		
Hydrophilidae		1/0
Oreianthus sp.		0/1
Notonectidae		0/41
Gyrinus sp.		0/6
TOTALS:	4/6	10/76

Table D-19

Epibenthic Catch Per Effort: Station 7, April and November, 1974

TAXA	NO. OF INDIVIDUALS PER EFFORT (APRIL/NOVEMBER)
ANNELIDA	
Hirudinea	
Mooreobdella microstoma	0/1
ARTHROPODA	
Crustacea	
Hyalella azteca	2/5
Astacidae	1/14
Procambarus sp.	0/3
Palaemonetes kadiakensis	13/51
Insecta	
Argia sp.	0/2
Notonectidae	1/17
Simulium sp.	0/1
Chironomidae	0/7
Hydrophilidae	2/0
Tanypus sp.	7/0
Chironomus sp.	4/0
Chaoborus sp.	1/0
MOLLUSCA	
Gastropoda	
Viviparus sp.	3/0
TOTALS: 9/9	34/101

Table D-20

Epibenthic Catch Per Effort: Station 9a, April and November, 1974

TAXA	NO. OF INDIVIDUALS PER EFFORT (APRIL/NOVEMBER)
ANNELIDA	
Hirudinea	
Mooreobdella microstoma	0/2
ARTHROPODA	
Crustacea	
Hyalella azteca	0/4
Astacidae	0/14
Palaemonetes kadiakensis	0/1
Insecta	
Macromia sp.	1/0
Isonychia sp.	0/8
Argia sp.	0/1
Ischnura sp.	0/4
Notonectidae	0/5
Chironomidae	0/43
MOLLUSCA	
Gastropoda	
Physa sp.	0/11
TOTALS: 1/10	1/93

Table D-21

Epibenthic Catch Per Effort: Station 10b, April and November, 1974

TAXA		NO. OF INDIVIDUALS PER EFFORT (APRIL/NOVEMBER)
ANNELIDA		
Hirudinea		
Helobdella sp.		0/1
Haemopis sp.		0/1
ARTHROPODA		
Crustacea		
Hyalella azteca		2/3
Palaemonetes kadiakensis		13/3
Astacidae		0/1
Insecta		
Isonychia sp.		0/2
Ischnura sp.		0/11
Chironomidae		0/7
Gyrinus sp.		1/0
Chaoborus sp.		4/0
MOLLUSCA		
Gastropoda		
Lymnaeidae		0/4
TOTALS:	4/8	20/33

Table D-22
Fishes in the Pine Bluff Study Area*

SPECIES	HABITAT	RELATIVE ABUNDANCE
POLYODONTIDAE		
Polydon spathula Paddlefish	Large streams and connected waters	Rare
ACIPENSERIDAE		
Scaphirhynchus platorynchus Shovelnose Sturgeon	Large streams, connected waters and lakes	Rare
AMIIDAE		
Amia calva Bowfin	Clear, quiet waters with abundant vegetation	Uncommon
LEPISOSTEIDAE		
Lepisosteus oculatus Spotted Gar	Quiet waters with abundant vegetation	Common
Lepisosteus platostomus Shortnose Gar	Mainstreams of large, muddy rivers	Uncommon
Lepisosteus spatula Alligator Gar	Quiet areas of large rivers	Rare
CLUPEIDAE		
Dorosoma cepedianum Gizzard Shad	Most stream and lake habitats	Abundant
ESOSIDAE		
Esox americanus Grass Pickerel	Pooled areas of relatively clear bayous, rivers and streams	Abundant
CYPRINIDAE		
Cyprinus carpio Carp	Quiet, shallow rivers and impoundments	Common
Hybognathus hayi Cypress Minnow	Quiet, backwater areas of rivers and bayous	Common
Notemigonus crysoleucas Golden Shiner	Clear, heavily vegetated habitats	Abundant
Notropis atherinoides Emerald Shiner	Quiet waters of larger rivers and lakes	Abundant
Notropis buchanani Ghost Shiner	Quiet backwaters over mud bottoms	Uncommon
Notropis chalybaeus Ironcolor Shiner	Quiet backwaters	Uncommon

Table D-22 (continued)

Notropis emiliae Pugnose Minnow	Lowland streams and lakes	Common
Notropis lutrensis Red Shiner	Clean, sandy-bottom creeks	Uncommon
Notropis maculatus Taillight Shiner	Sluggish bayous and oxbow lakes	Common
Notropis rubellus Rosyface Shiner	Backwater areas of large streams	Uncommon
Notropis texanus Weed Shiner	Sluggish bayous and back-water areas	Common
Notropis umbratilis Redfin Shiner	Clean, sandy-bottom creeks	Common
Notropis venustus Blacktail Shiner	Flowing, clear to slightly turbid streams	Uncommon
Notropis volucellus Mimic Shiner	Rivers and larger streams with gravel or hard bottoms	Uncommon
Notropis spp. (hybrid)**	- -	- -
Pimephales vigilax Bullhead Minnow	Pools and backwaters of sluggish streams and rivers	Abundant
CATOSTOMIDAE		
Carpiodes carpio River Carpsucker	Quiet, silt-bottomed back-waters and pools of large rivers	Abundant
Erimyzon oblongus Creek Chubsucker	Clear pools and backwaters of streams	Common
Ictiobus bubalus Smallmouth Buffalo	Oxbow lakes and backwaters of streams	Common
Ictiobus cyprinellus Bigmouth Buffalo	Oxbows and sloughs of larger rivers	Common
Ictiobus niger Black Buffalo	Flowing waters in streams; quiet impounded waters	Common
Minytrema melanops Spotted Sucker	Slow waters of creeks having hard bottoms	Common
ICTALURIDAE		
Ictalurus melas Black Bullhead	Quiet streams and backwaters with soft, muddy bottoms	Abundant
Ictalurus natalis Yellow Bullhead	Clear, flowing waters with abundant vegetation	Common
Ictalurus punctatus Channel Catfish	Streams with moderate current and sand, gravel or rubble bottom	Abundant
Ictalurus furcatus Blue Catfish	Large lakes and deeper portions of large rivers	Uncommon

Table D-22 (continued)

Pylodictus olivaris Flathead Catfish	Deep holes of river beds; lakes and large streams	Uncommon
Noturus gyrinus Tadpole Madtom	Quiet streams and backwaters with soft muddy bottoms	Abundant
CYPRINODONTIDAE		
Fundulus chrysotus Golden Topminnow	Quiet, weedy backwaters and oxbows of large rivers	Uncommon
Fundulus notti Starhead Topminnow	Quiet, weedy backwaters and oxbows of rivers	Common
Fundulus olivaceus Blackspotted Topminnow	Relatively clear, weedy portions of lakes, canals and streams	Abundant
POECILIIDAE		
Gambusia affinis Mosquitofish	Backwaters of sluggish lowland streams and canals	Abundant
APHREDODERIDAE		
Aphredoderus sayanus Pirate Perch	Quiet waters of ponds, swamps and sluggish streams	Abundant
ATHERINIDAE		
Labidesthes sicculus Brook Silverside	Calm pools and backwaters in streams	Abundant
PERCICHTHYIDAE		
Morone saxitalis Striped Bass	Large rivers and impound-ments	Uncommon
Morone chrysops White Bass	Large rivers and small tributaries	Uncommon
Morone mississippiensis Yellow Bass	Lakes and quiet backwaters and pools of larger rivers	Common
CENTRARCHIDAE		
Centrarchus macropterus Flier	Clear quiet backwaters with sandy bottoms	Uncommon
Lepomis cyanellus Green Sunfish	Clear to turbid creeks and backwaters	Abundant
Lepomis gulosus Warmouth	Sluggish lowland streams with muddy bottoms	Common
Lepomis humilis Orangespotted Sunfish	Streams with sluggish, turbid waters	Common
Lepomis macrochirus Bluegill	Clear waters with ample vegetation	Abundant
Lepomis marginatus Dollar Sunfish	Lowland, swampy areas and sluggish bayous	Uncommon

Table D-22 (continued)

Lepomis megalotis Longear Sunfish	Clear lakes and streams	Common
Lepomis microlophus Redear Sunfish	Clear, still waters with some vegetation	Uncommon
Lepomis punctatus Spotted Sunfish	Clear, quiet brown water	Uncommon
Lepomis auritus Redbreast Sunfish	Clear streams and lakes with some vegetation	Uncommon
Micropterus punctulatus Spotted Bass	Deep pools of moderate to large streams	Uncommon
Micropterus salmoides Largemouth Bass	Most clear streams and lakes	Abundant
Pomoxis annularis White Crappie	Brushy areas in clear-to-turbid streams and lakes	Common
Pomoxis nigromaculatus Black Crappie	Brushy and weedy areas of clear streams and lakes	Abundant
ELASOMATIDAE		
Elassoma zonatum Banded Pygmy Sunfish	Clear, quiet waters with abundant vegetation	Uncommon
PERCIDAE		
Etheostoma caeruleum Rainbow Darter	Clear, flowing streams with sandy bottoms	Uncommon
Etheostoma chlorosomum Bluntnose Darter	Sluggish creeks with mud or clay bottoms	Uncommon
Etheostoma fusiforme Swamp Darter	Clear, sluggish bayous and backwaters	Uncommon
Etheostoma gracile Slough Darter	Lowland streams, ponds and sloughs	Common
Etheostoma proeliare Cypress Darter	Clear, slow-moving bayous with abundant vegetation	Common
Etheostoma stigmaeum Speckled Darter	Large, clear streams with moderate gradients	Uncommon
Etheostoma whipplei Redfin Darter	Slow-moving streams with mixed sand and gravel bottoms	Uncommon
SCIAENIDAE		
Aplodinotus grunniens Freshwater Drum	Deeper pools of rivers and lakes	Common

* Fish lists were generated from VTN Louisiana sampling data, Buchanan (1973), Pinkham _et al_. (1972) and the Arkansas Game and Fish Commission (pers. comm.). Habitat requirements were taken from Cross (1967) and Smith-Vaniz (1968).

**Personal communications with Dr. N. Douglas, Northeast Louisiana University, Monroe.

Table D-23
Fish Community Studies (1974): Station 1

SPECIES	TECHNIQUE: SEINE (APRIL OR APRIL/NOVEMBER) NO.	Length (mm) $\bar{x}$	Length (mm) RANGE	Weight (g) $\bar{x}$	Weight (g) RANGE	ROTENONE (JUNE) NO.	Length (mm) $\bar{x}$	Length (mm) RANGE	Weight (g) $\bar{x}$	Weight (g) RANGE
Dorosoma cepedianum	3	148	140 - 152	33.2	29.0 - 35.4	8	133	77 - 157	20.9	6.7 - 31.2
Esox americanus	4	129	57 - 201	32.2	1.6 - 72.5	17	204	75 - 245	82.9	2.6 -105.0
Notemigonus chrysoleucas	4	106	94 - 115	14.3	9.6 - 19.2	7	109	98 - 125	13.1	8.1 - 18.6
Hybognathus hayi	-	-	-	-	-	10	94	91 - 99	6.3	5.5 - 7.5
Notropis umbratilus	36	57	47 - 77	2.2	1.1 - 5.2	26	59	46 - 71	2.2	0.9 - 3.7
Notropis maculatus	-	-	-	-	-	4	39	26 - 51	0.8	0.3 - 1.5
Erimyzon oblongus	-	-	-	-	-	17	152	92 - 203	55.4	9.9 -123.2
Minytrema melanops	-	-	-	-	-	15	144	124 - 169	32.3	20.0 - 50.3
Noturus gyrinus	-	-	-	-	-	5	51	18 - 107	4.5	0.1 - 15.4
Ictalurus natalis	-	-	-	-	-	3	144	120 - 167	42.2	24.0 - 62.8
Ictalurus melas	-	-	-	-	-	1	175	175	67.8	67.8
Fundulus olivaceus	21/ 5	67/ 37	51 - 94/ 33 - 41	3.5/ 0.6	1.4 - 9.5 0.4 - 0.8	14/ -	79/ -	50 - 91/ -	5.0/ -	1.4 - 7.0/ -
Aphredoderus sayanus	-	-	-	-	-	6	61	27 - 93	5.0	0.4 - 11.7
Centrarchus macropterus	3/ 1	146	144 - 148	68.6	66.5 - 73.8	4	154	136 - 182	72.2	46.8 - 98.8
Lepomis gulosus	1/ 2	146/ 40	146/ 26 - 55	87.2/ 1.6	87.2/ 0.1 - 3.2	21/ -	113/ -	44 - 156/ -	45.4/ -	1.5 -102.1/ -
Lepomis punctatus	-	-	-	-	-	1	52	52	2.7	2.7
Lepomis microlophus	-	-	-	-	-	2	78	77 - 79	8.2	7.9 - 8.6

Table D-23 (continued)
Station 1

Lepomis macrochirus	5/ 1	72/ 122	39 - 114/ 122	10.8/ 35.8	1.3 - 31.1/ 35.8	32	90	38 - 146	16.8	1.2 - 69.2
Lepomis megalotus	-	-	-	-	-	13	95	63 - 178	31.6	6.3 -173.7
Lepomis cyanellus	4	50	38 - 58	3.2	1.4 - 4.1	10	77	39 - 149	18.0	1.4 - 89.1
Lepomis marginatus	2	96	86 - 107	25.4	16.1 - 34.8	16	60	52 - 90	5.5	3.1 - 19.6
Lepomis sp.	-/ 1	-/ 21	-/ 21	-/ 0.1	-/ 0.1	-	-	-	-	-
Poxomis nigromaculatus	-	-	-	-	-	1	162	162	57.7	57.7
Micropterus salmoides	-	-	-	-	-	1	249	249	264.9	264.9
Elassoma zonatum	-	-	-	-	-	10	20	17 - 21	0.1	0.1
Etheostoma gracile	-	-	-	-	-	9	39	27 - 52	0.6	0.2 - 1.2
Etheostoma proeliare	-/ 2	-/ 34	-/ 33 - 35	-/ 0.4	-/ 0.2 - 0.5	7/ -	28/ -	20 - 38/ -	0.2/ -	0.1 - 0.4/ -
Etheostoma whipplei	-	-	-	-	-	6	31	27 - 38	0.3	0.2 - 0.5
Etheostoma fusiforme	-	-	-	-	-	2	26	25 - 28	0.2	0.1 - 0.2
Etheostoma sp.	1	23	23	0.3	0.3	-	-	-	-	-

Table D-24
Fish Community Studies (1974): Station 3

SPECIES	TECHNIQUE: SEINE (MAY or MAY/NOVEMBER)				
	NO.	Length (mm)		Weight (g)	
		$\bar{x}$	RANGE	$\bar{x}$	RANGE
Dorosoma cepedianum	15	145	119 - 331	47.4	15.1 -360.2
Esox americanus	12	113	60 - 204	20.9	1.3 - 64.2
Notemigonus chrysoleucas	3/ 7	68/ 94	36 - 111/ 85 - 100	4.0/ 7.7	0.4 - 10.2/ 5.4 - 9.3
Hybognathus hayi	8	82	68 - 93	3.9	2.2 - 6.5
Notropis emiliae	0/ 43	0/ 46	0 / 31 - 55	0/ 0.8	0 / 0.3 - 1.3
Notropis maculatus	2/ 33	51/ 31	51 / 23 - 36	0.8/ 0.4	0.6 - 1.0/ 0.1 - 0.6
Notropis texanus	21	54	48 - 62	1.5	1.1 - 2.3
Notropis umbratilus	4	56	53 - 58	1.4	1.1 - 1.8
Notropis sp.	1	57	57	1.6	1.6
Fundulus chrysotus	2	52	48 - 57	2.0	1.5 - 2.4
Fundulus notti	3/ 3	64/ 34	49 - 73/ 23 - 42	3.3/ 0.6	0.8 - 4.8/ 0.2 - 0.9
Fundulus olivaceus	-/ 2	- / 40	- / 34 - 45	- / 0.6	- / 0.4 - 0.8
Gambusia affinis	48/ 10	35/ 25	24 - 45/ 18 - 33	0.6/ 0.2	0.1 - 1.2/ 0.1 - 0.3
Aphredoderus sayanus	7/ 1	35/ 93	31 - 41/ 93	0.8/ 11.9	0.6 - 1.1/ 11.9
Labidesthes sicculus	15/ 15	63/ 47	42 - 77/ 32 - 63	1.5/ 0.5	0.5 - 2.4/ 0.2 - 1.1
Lepomis gulosus	1	56	56	3.8	3.8
Lepomis humilus	6	74	55 - 93	8.5	3.1 - 14.9
Lepomis macrochirus	47/ 15	47/ 47	22 - 90/ 28 - 70	2.5/ 2.3	0.3 - 13.1/ 0.5 - 5.7
Lepomis marginatus	1	94	94	24.6	24.6
Lepomis microlophus	6	83	65 - 143	16.8	5.7 - 67.6
Poxomis nigromaculatus	0/ 1	0/ 145	0 / 145	0/ 36.1	0 / 36.1
Elassoma zonatum	0/ 1	0/ 28	0/ 28	0/ 0.4	0 / 0.4
Etheostoma proeliare	0/ 3	0/ 31	0/ 27 - 34	0/ 0.3	0 / 0.2 - 0.4

Table D-25
Fish Community Studies (1974): Station 5

SPECIES	TECHNIQUE									
	SEINE (MAY)					ROTENONE (JUNE)				
	NO.	Length (mm)		Weight (g)		NO.	Length (mm)		Weight (g)	
		$\bar{x}$	RANGE	$\bar{x}$	RANGE		$\bar{x}$	RANGE	$\bar{x}$	RANGE
Dorosoma cepedianum	-	-	-	-	-	9	154	64 - 257	45.0	2.5 -177.1
Esox americanus	1	63	63	1.7	1.7	13	112	71 - 195	13.5	2.4 - 64.1
Notemigonus chrysoleucas	1	85	85	6.7	6.7	14	86	55 - 117	6.6	1.4 - 17.0
Notropis chalybaeus	-	-	-	-	-	-	-	-	-	-
Notropis volucellus	1	48	48	1.1	1.1	2	91	89 - 93	6.6	5.9 - 7.4
Notropis rubellus	-	-	-	-	-	2	68	66 - 69	2.2	2.0 - 2.4
Notropis antherinoides	-	-	-	-	-	97	46	37 - 61	1.1	0.4 - 2.0
Notropis texanus	2	52	47 - 57	1.7	1.1 - 2.3	10	73	53 - 87	3.3	1.0 - 6.4
Notropis umbratilus	-	-	-	-	-	19	52	43 - 61	1.4	0.9 - 2.3
Notropis emiliae	-	-	-	-	-	21	55	42 - 72	1.7	0.4 - 3.7
Notropis buchanani	1	53	53	1.3	1.3	-	-	-	-	-
Minytrema melanops	-	-	-	-	-	2	140	137 - 144	27.5	23.2 - 31.8
Ictalurus natalis	-	-	-	-	-	41	41	13 - 157	3.1	0.2 - 56.6
Noturus gyrinus	-	-	-	-	-	22	36	17 - 50	0.9	0.1 - 1.9
Fundulus olivaceus	-	-	-	-	-	1	73	73	3.7	3.7
Gambusia affinis	42	34	25 - 45	0.6	0.2 - 1.5	41	45	28 - 89	1.9	0.2 - 11.8
Aphredoderus sayanus	1	76	76	8.0	8.0	42	72	40 - 110	8.7	1.7 - 31.5
Centrarchus macropterus	-	-	-	-	-	1	125	125	57.4	57.4
Lepomis gulosus	3	55	54 - 57	3.1	3.1 - 3.2	15	80	62 - 108	13.7	5.3 - 35.7
Lepomis humilis	-	-	-	-	-	5	67	54 - 77	6.6	2.7 - 10.7

Table D-25 (continued)
Station 5

Lepomis punctatus	-	-	-	-	-	5	79	61 - 99	13.5	4.1 - 29.7
Lepomis macrochirus	2	70	62 - 78	6.5	4.8 - 8.2	10	98	66 - 163	29.4	5.0 -102.7
Lepomis marginatus	4	60	53 - 69	5.4	3.6 - 7.7	1	64	64	6.2	6.2
Lepomis cyanellus	-	-	-	-	-	11	77	53 - 110	11.1	2.7 - 27.7
Lepomis spp.	-	-	-	-	-	4	30	28 - 32	0.5	0.5 - 0.6
Elassoma zonatum	-	-	-	-	-	6	24	19 - 35	0.6	0.3 - 1.1
Etheostoma chlorosomum	2	34	19 - 50	0.6	0.1 - 1.0	4	36	26 - 51	0.6	0.3 - 1.1
Etheostoma gracile	-	-	-	-	-	2	34	33 - 35	0.4	0.4
Etheostoma caeruleum	-	-	-	-	-	2	28	26 - 31	0.2	0.2 - 0.3
Etheostoma stigmaeum	-	-	-	-	-	1	22	22	0.2	0.2
Aplodinotus grunniens	-	-	-	-	-	4	139	136 - 143	27.2	24.7 - 29.3

Table D-26
Fish Community Studies (1974): Station 7

SPECIES	NO.	TECHNIQUE: ROTENONE (JUNE)			
		Length (mm)		Weight (g)	
		$\bar{x}$	RANGE	$\bar{x}$	RANGE
Lepisosteus oculatus	1	504	504	358.1	358.1
Dorosoma cepedianum	78	196	38 - 261	79.9	1.0 - 161.7
Esox americanus	2	80	53 - 106	3.8	1.2 - 6.4
Hybognathus hayi	2	94	92 - 95	6.0	5.6 - 6.4
Notropis venustus	3	81	71 - 88	6.4	3.5 - 8.4
Notropis lutrensis	8	66	53 - 80	3.4	1.2 - 6.1
Notemigonus chrysoleucas	40	68	39 - 112	3.6	0.1 - 13.3
Pimephales vigilax	3	75	70 - 79	5.0	3.8 - 6.1
Ictalurus natalis	15	162	47 - 234	103.3	3.5 - 175.1
Ictalurus melas	10	160	123 - 216	67.6	26.9 - 146.8
Ictalurus punctatus	1	101	101	9.8	9.8
Fundulus olivaceus	2	78	77 - 78	4.2	4.2 - 4.3
Gambusia affinis	13	44	39 - 50	1.3	0.9 - 1.6
Aphredoderus sayanus	32	65	39 - 103	5.2	1.1 - 16.1
Lepomis gulosus	17	75	51 - 151	12.7	3.0 - 80.9
Lepomis cyanellus	12	78	51 - 122	12.8	2.4 - 42.1
Lepomis marginatus	3	83	64 - 97	13.8	5.4 - 21.5
Lepomis punctatus	1	129	129	60.9	60.9
Lepomis macrochirus	28	72	34 - 155	12.2	0.6 - 85.3
Lepomis megalotus	32	107	76 - 132	33.1	9.3 - 53.7
Pomoxis nigromaculatus	2	61	57 - 65	3.0	2.4 - 3.5
Micropterus salmoides	4	54	34 - 67	2.5	0.8 - 3.6
Aplodinotus grunniens	13	159	133 - 282	56.7	26.0 - 290.7

TABLE D-27
Fish Community Studies (1974): Station 10b

SPECIES	TECHNIQUE									
	SEINE (JUNE or JUNE/NOVEMBER)					GILL NET (MAY)/ROTENONE (JUNE)				
	NO.	Length (mm)		Weight (g)		NO.	Length (mm)		Weight (g)	
		$\bar{x}$	RANGE	$\bar{x}$	RANGE		$\bar{x}$	RANGE	$\bar{x}$	RANGE
Lepisosteus oculatus	1	52	52	0.2	0.2	1/ -	738/ -	738 / -	1,379.2/ -	1,374.2- / -
Dorosoma cepedianum	3/ 6	239/ 97	216 - 257/ 54 - 147	114.4/ 8.9	76.7 -142.6/ 3.4 - 29.6	5/ 65	212/ 75	200 -223/ 31 -239	83.8/ 17.5	75.8- 92.9/ 0.2-112.9
Esox americanus	-	-	-	-	-	-/ 2	- / 134	- / 97 -172	- / 18.0	- / 5.0- 31.1
Pimephales vigilax	-	-	-	-	-	-/ 12	- / 50	- / 22 - 78	- / 1.9	- / 0.1- 4.8
Notemigonus chrysoleucas	-	-	-	-	-	-/ 3	- / 68	- / 63 - 71	- / 2.4	- / 2.2- 2.5
Notropis antherinoides	-/ 2	-/ 72	- / 71 - 72	- / 2.8	- / 2.7 - 2.8	-/ 2	- / 77	- / 75 - 79	- / 3.0	- / 2.8- 3.1
Notropis lutrensis	-	-	-	-	-	-/ 1	- / 52	- / 52	- / 1.3	- / 1.3
Ictiobus cyprinellus	2	76	75 - 76	6.6	6.2 - 6.9	-	-	-	-	-
Ictiobus niger	-	-	-	-	-	-/ 2	- / 289	- / 247 -331	- / 485.7	- / 275.3-696.1
Ictiobus bubalus	1	287	287	348.6	348.6	4/ 12	445/ 50	304 -756/ 22 - 78	832.6/ 1.9	406.6-153.5/ 0.1- 4.8
Cyprinus carpio	-	-	-	-	-	2/ -	289/ -	206 -372/ -	610.2/ -	464.2-756.2/ -
Minytrema melanops	-	-	-	-	-	2/ 2	142/ 184	132 -151/ 175 -193	27.4/ 66.6	22.7- 32.1/ 55.1- 78.2

Table D-27 (continued)
Station 10b

Ictalurus punctatus	-	-	-	-	-	4/ 9	254/ 203	231 -282/ 122 -323	- / 112.2	- / 15.5-382.2
Fundulus chrysotus	3	78	75 - 80	5.5	4.7 - 5.9	-	-	-	-	-
Gambusia affinis	10/ 3	33/ 33	25 - 41/ 32 - 34	0.7/ 0.7	0.4 - 1.0/ 0.6 - 0.8	-/ 9	- / 32	- / 22 - 42	- / 0.5	- / 0.3- 1.1
Labidesthes sicculus	40/ 74	44/ 41	36 - 58/ 32 - 56	0.5/ 0.4	0.3 - 1.2/ 0.2 - 1.1	-/ 3	- / 51	- / 41 - 59	- / 1.0	- / 0.6- 1.4
Lepomis cyanellus	-	-	-	-	-	1/ 1	144/ 69	144 / 69	60.2/ 6.0	60.2 / 6.0
Lepomis humilus	-	-	-	-	-	-/ 2	- / 54	- / 44 - 63	- / 2.0	- / 0.9- 3.2
Lepomis megalotus	1	98	98	20.8	20.8	3/ 6	117/ 106	110 -127/ 89 -126	39.0/ 28.0	34.1- 46.1/ 13.0- 48.4
Lepomis macrochirus	4/ 8	68/ 45	25 - 110/ 22 - 73	11.3/ 2.4	0.4 - 22.4/ 0.3 - 6.4	1/ 18	128/ 70	128 / 24 -184	43.9/ 15.1	43.9 / 0.1-123.6
Lepomis gulosus	-	-	-	-	-	-/ 1	- / 41	- / 41	- / 1.0	- / 1.0
Lepomis spp.	-/ 3	-/ 32	- / 30 - 33	- / 0.5	- / 0.4 - 0.6	-/ 6	- / 34	- / 26 - 42	- / 0.6	- / 0.1- 1.0
Morone mississippiensis	-	-	-	-	-	2/ -	216/ -	194 -237/ -	112.3/ -	90.5-134.1/ -
Pomoxis nigromaculatus	-	-	-	-	-	-/ 3	- / 85	- / 55 -137	- / 12.2	- / 0.9- 33.1
Pomoxis annularis	-	-	-	-	-	1/ 41	227/ 44	227 / 32 - 63	519.3/ 0.8	519.3 / 0.2- 2.9
Micropterus salmoides	1	91	91	10.2	10.2	-/ 13	- / 64	- / 49 - 88	- / 3.5	- / 1.7- 10.0
Aplodinotus grunniens	-	-	-	-	-	-/ 14	- / 166	- / 125 -210	- / 51.5	- / 18.6-101.3

Table D-28
Reptiles and Amphibians of the Pine Bluff Study Area*

SPECIES	HABITAT	RELATIVE ABUNDANCE
ALLIGATOR		
Alligator mississippiensis American Alligator	Secluded stream and backwater areas	Rare
TURTLES		
Chelydra serpentina Common Snapping Turtle	Bottomlands, backwater areas	Common
Chrysemys picta dorsalis Southern Painted Turtle	Bottomlands, backwater areas	Common
Deirochelys reticularia miaria Western Chicken Turtle	Quiet backwaters	Common
Graptemys kohni Mississippi Map Turtle	Streams of bottomlands	Common
Graptemys pseudogeographica ouachitensis Ouachita Map Turtle	Upland streams	Common
Kinosternon subrubrum hippocrepis Mississippi Mud Turtle	Ponds and backwater areas	Common
Chrysemys concinna hieroglyphica Slider	Slow-moving streams and backwater areas	Common
Chrysemys floridana hoyi Missouri Slider	Slow-moving streams and backwater areas	Common
Chrysemys scripta elegans Red-eared Turtle	Ponds and lakes	Common
Sternotherus carinatus Razor-backed Musk Turtle	Streams	Common
Sternotherus odoratus Stinkpot Turtle	Streams and ponds	Common
Terrapene carolina triunguis Three-toed Box Turtle	Upland woods	Common
Trionyx muticus Smooth Softshell Turtle	Streams and ponds	Common
Trionyx spiniferus Spiny Softshell Turtle	Streams and ponds	Common
Macroclemys temmincki Alligator Snapping Turtle	Lakes and ponds	Uncommon

Table D-28 (continued)

LIZARDS		
Anolis c. carolinensis Green Anole	Uplands	Common
Cnemidophorus s. sexlineatus Six-lined Racerunner	Uplands	Common
Eumeces fasciatus Five-lined Skink	Uplands	Common
Eumeces laticeps Broad-headed Skink	Hardwood leaf litter	Common
Leiolopisma laterale Ground Skink	Hardwood leaf litter	Common
Ophisaurus a. attenuatus Western Slender Glass Lizard	Open areas throughout	Common
Sceloporus undulatus hyacinthinus Northern Fence Lizard	Upland woods	Common
SNAKES		
Agkistrodon c. contortrix Southern Copperhead	Woods throughout	Common
Agkistrodon piscivorus leucostoma Western Cottonmouth	Bottomlands, backwaters	Common
Carphophis amoenus vermis Western Worm Snake	Throughout	Common
Cemophora coccinea Scarlet Snake	Throughout	Common
Coluber constrictor priapus Southern Black Racer	Woods	Common
Crotalus horridus atricaudatus Canebrake Rattlesnake	Bottomlands	Common
Diadophis punctatus stictogenys Mississippi Ringneck Snake	Bottomlands	Common
Elaphe obsoleta obsoleta Black Rat Snake	Bottomlands	Common
Elaphe obsoleta spiloides Gray Rat Snake	Upland woods	Common
Farancia abacura reinwardti Western Mud Snake	Stream courses, shallow waters	Common
Virginia striatula Rough Earth Snake	Upland woods and fields	Common
Virginia valeriae elegans Western Smooth Earth Snake	Upland woods and fields	Common
Heterodon platyrhinos Eastern Hognose Snake	Upland woods	Common

Table D-28 (continued)

Lampropeltis c. calligaster Prairie Kingsnake	Fields	Common
Lampropeltis triangulum amaura Louisiana Milk Snake	Fields	Common
Lampropeltis getulus holbrooki Speckled Kingsnake	Fields	Common
Masticophis f. flagellum Eastern Coachwhip	Fields	Common
Micrurus fulvius tenere Texas Coral Snake	Bottomland hardwoods	Common
Natrix c. cyclopion Green Watersnake	Bottomland waters	Common
Natrix erythrogaster flavigaster Yellow-bellied Watersnake	Bottomland waters	Common
Natrix grahami Graham's Watersnake	Upland waters	Common
Natrix r. rhombifera Diamond-backed Watersnake	Bottomland waters	Common
Natrix rigida Glossy Watersnake	Bottomland waters	Common
Natrix sipedon confluens Broad-banded Watersnake	Bottomland waters	Common
Natrix sipedon pleuralis Midland Watersnake	Bottomland waters	Common
Opheodrys aestivus Rough Green Snake	Uplands	Common
Sistrurus miliarus streckeri Western Pygmy Rattlesnake	Uplands	Common
Storeria dekayi wrightorum Midland Brown Snake	Woods throughout	Common
Storeria o. occipitomaculata Northern Red-bellied Snake	Woods throughout	Common
Thamnophis p. proximus Western Ribbon Snake	Woods, fields throughout	Common
Thamnophis sirtalis sirtalis Eastern Garter Snake	Woods, fields throughout	Common
SALAMANDERS		
Ambystoma maculatum Spotted Salamander	Ponds, slow-moving streams	Common
Ambystoma opacum Marbled Salamander	Bottomlands	Common
Ambystoma texanum Small-mouth Salmander	Bottomlands	Common

Table D-28 (continued)

Ambystoma t. tigrinum Eastern Tiger Salamander	Farm ponds, wet areas	Common
Amphiuma tridactylum Three-toed Amphiuma	Swamp areas, backwater areas	Common
Desmognathus fuscus brimleyorum Central Dusky Salamander	Moist areas throughout	Common
Notophthalmus viridescens louisianensis Central Newt	Moist areas throughout	Common
Necturus maculosus louisianensis Louisiana Waterdog	Streams and ponds of bottomlands	Common
Plethodon g. glutinosus Slimy Salamander	Streams and ponds of bottomlands	Common
Siren intermedia nettingi Western Lesser Siren	Streams and ponds of bottomlands	Common
FROGS AND TOADS		
Scaphiopus h. holbrooki Eastern Spadefoot	Wet sandy soils	Common
Bufo americanus American Toad	Shallow water areas	Common
Bufo woodhousei fowleri Fowler's Toad	Moist sandy areas	Abundant
Hyla crucifer Spring Peeper	Temporary pons of cut-over woodlots	Abundant
Hyla versicolor Gray Treefrog	Small temporary ponds in woodlands	Common
Hyla cinerea Green Treefrog	Standing water	Common
Acris crepitans Northern Treefrog	Pond and moist areas	Common
Gastrophryne carolinensis Eastern Narrow-mouthed Toad	Stream and swamp borders	Common
Pseudacris triseriata feriarum Upland Chorus Frog	Wet areas of uplands	Common
Rana palustris Pickerel Frog	Meadow waters	Common
Rana utricularia Southern Leopard Frog	Shallow water, ponds and pools	Abundant
Rana clamitans clamitans Bronze Frog	All wet areas	Common
Rana catesbeiana Bull Frog	All wet areas	Abundant

* This list is based on Conant (1958), the field observations of VTN Louisiana, Inc. and personal communication with Dr. J.S. Rogers, University of New Orleans. It should be considered relatively complete for the Study Area.

Table D-29
Birds of Jefferson County and the Pine Bluff Study Area

SPECIES	HABITAT	SEASONAL STATUS	RELATIVE ABUNDANCE IN REGION
GAVIIFORMES			
Common Loon _Gavia immer_	Water bodies	Winter	Rare
Red-throated Loon _Gavia stellata_	Water bodies	Winter	Accidental
PODICIPEDIFORMES			
Horned Grebe _Podiceps auritus_	Water bodies	Winter	Uncommon
Eared Grebe _Podiceps nigricollis_	Water bodies	Winter	Occasional
Pied-billed Grebe _Podilymbus podiceps_	Water bodies	Permanent	Common*+
PELECANIFORMES			
White Pelican _Pelecanus erythrorhynchos_	Water bodies	Migrant	Uncommon
Double-crested Cormorant _Phalacrocorax auritus_	Water bodies	Winter	Occasional
Anhinga _Anhinga anhinga_	Swamps, lakes, ponds	Summer	Rare
CICONIIFORMES			
Great Blue Heron _Ardea herodias_	Water habitats	Permanent	Common+
Green Heron _Butorides virescens_	Water habitats	Summer	Common*+
Little Blue Heron _Florida caerulea_	Water habitats	Summer	Uncommon*+
Cattle Egret _Bubulcus ibis_	Pastures and water habitats	Summer(A)	Uncommon+
Great Egret _Casmerodius albus_	Water habitats	Summer(A)	Uncommon
Snowy Egret _Egretta thula_	Water habitats	Migrant	Rare
Black-crowned Night Heron _Nycticorax nycticorax_	Water habitats	Migrant	Rare
Yellow-crowned Night Heron _Nyctanassa violacea_	Water habitats	Summer	Uncommon*+
Least Bittern _Ixobrychus exilis_	Water habitats	Summer(A)	Rare+
American Bittern _Botaurus lentiginosus_	Water habitats	Migrant	Occasional

Table D-29 (continued)

White-faced Ibis _Plegadis chihi_	Water habitats	Wanderer	Accidental
White Ibis _Eudocimus albus_	Water habitats	Migrant	Rare
Roseate Spoonbill _Ajaia ajaja_	Water habitats	Wanderer	Accidental
ANSERIFORMES			
Whistling Swan _Olor columbianus_	Water habitats	Winter	Occasional
Canada Goose _Branta canadensis_	Water habitats	Winter	Uncommon
White-fronted Goose _Anser albifrons_	Water habitats	Winter	Occasional
Snow Goose _Chen caerulescens_	Water habitats	Winter	Uncommon+
Mallard _Anas platyrhynchos_	Water habitats	Winter(A)	Common+
Black Duck _Anas rubripes_	Water habitats	Winter	Uncommon
Gadwall _Anas strepera_	Water habitats	Winter	Common
Pintail _Anas acuta_	Water habitats	Winter	Common
Green-winged Teal _Anas crecca_	Water habitats	Winter	Common+
Blue-winged Teal _Anas discors_	Water habitats	Winter(A)	Common+
American Wigeon _Anas americana_	Water habitats	Winter	Common
Northern Shoveler _Anas clypeata_	Water habitats	Winter	Common
Wood Duck _Aix sponsa_	Wooded swamps, water habitats	Permanent	Common*+
Redhead _Aythya americana_	Water bodies	Winter	Uncommon
Ring-necked Duck _Aythya collaris_	Water bodies	Winter	Common
Canvasback _Aythya valisineria_	Water bodies	Winter	Uncommon
Lesser Scaup _Aythya affinis_	Water bodies	Winter	Common
Common Goldeneye _Bucephala clangula_	Water bodies	Winter	Uncommon
Bufflehead _Bucephala albeola_	Water bodies	Winter	Uncommon

Oldsquaw Clangula hyemalis	Water bodies	Winter	Occasional
White-winged Scoter Melanitta deglandi	Water bodies	Winter	Rare
Ruddy Duck Oxyura jamaicensis	Water bodies	Winter	Abundant
Hooded Merganser Lophodytes cucullatus	Water bodies	Winter(A)	Uncommon+
Common Merganser Mergus merganser	Water bodies	Winter	Rare
Red-breasted Merganser Mergus serrator	Water bodies	Winter	Uncommon
FALCONIFORMES			
Turkey Vulture Cathartes aura	Various habitats	Permanent	Common*+
Black Vulture Coragyps atratus	Various habitats	Winter	Uncommon+
Mississippi Kite Ictinia misisippiensis	Brushland near open woods and water	Summer	Uncommon*+
Sharp-shinned Hawk Accipiter striatus	Open woodlands and wood margins	Winter	Uncommon
Cooper's Hawk Accipiter cooperii	Open woodlands and wood margins	Permanent	Uncommon*+
Red-tailed Hawk Buteo jamaicensis	Open woodlands and wood margins	Permanent	Common*+
Red-shouldered Hawk Buteo lineatus	Moist woodlands	Permanent	Common*+
Broad-winged Hawk Buteo platypterus	Upland woods	Summer	Uncommon*+
Swainson's Hawk Buteo swainsoni	Open woodlands, wood margins	Migrant	Rare
Golden Eagle Aquila chrysaetos	Large open areas near woods	Winter	Occasional
Bald Eagle Haliaeetus leucocephalus	Rivers, lakes	Winter	Uncommon+
Marsh Hawk Circus cyaneus	Fields, grass-lands	Winter	Common+
Osprey Pandion haliaetus	Near water bodies	Winter(A)	Uncommon
Peregrine Falcon Falco peregrinus	Shorelines, woods	Migrant	Rare
Merlin Falco columbarius	Open woods, near lakes	Migrant	Rare
American Kestrel Falco sparverius	Open woods, roadsides	Permanent	Common*+

Table D-29 (continued)

GALLIFORMES			
Bobwhite *Colinus virginianus*	Open woodlands, margins	Permanent	Common*+
Turkey *Meleagris gallopavo*	Bottomlands, uplands with dense cover	Permanent	Uncommon*
GRUIFORMES			
Virginia Rail *Rallus limicola*	Near water courses	Migrant(A)	Rare
Sora *Porzana carolina*	Open swamps	Migrant(A)	Uncommon+
Purple Gallinule *Porphyrula martinica*	Along water courses, swamps	Summer	Occasional*+
Common Gallinule *Gallinula chloropus*	Water habitats	Summer	Uncommon*+
American Coot *Fulica americana*	Water habitats	Winter(A)	Abundant
CHARADRIIFORMES			
Semipalmated Plover *Charadrius semipalmatus*	Mudflats, shorelines	Migrant	Uncommon
Piping Plover *Charadrius melodus*	Shorelines	Migrant	Rare
Killdeer *Charadrius vociferus*	Pastures, fields, shorelines	Permanent	Common*+
American Golden Plover *Pluvialis dominica*	Fields, dry flats	Migrant	Rare
Black-bellied Plover *Pluvialis squatarola*	Mudflats, shorelines	Migrant	Uncommon
Ruddy Turnstone *Arenaria interpres*	Mudflats, shorelines	Migrant	Rare
American Woodcock *Philohela minor*	Mixed forests, lowlands	Permanent	Common*+
Common Snipe *Capella gallinago*	Wet habitats	Winter	Common+
Spotted Sandpiper *Actitis macularia*	Shorelines, mudflats	Migrant(A)	Common+
Solitary Sandpiper *Tringa solitaria*	Water habitats	Migrant	Uncommon+
Lesser Yellowlegs *Tringa flavipes*	Shallow-water habitats	Migrant	Uncommon
Greater Yellowlegs *Tringa melanoleuca*	Shallow-water habitats	Migrant	Uncommon
Pectoral Sandpiper *Calidris melanotos*	Mudflats, shores	Migrant	Common
White-rumped Sandpiper *Calidris fuscicollis*	Mudflats, shores	Migrant	Uncommon

Table D-29 (continued)

Least Sandpiper Calidris minutilla	Mudflats, shores, wet fields	Migrant(A)	Common
Semipalmated Sandpiper Calidris pusilla	Shores, mud-flats, marshes	Migrant	Uncommon
Western Sandpiper Calidris mauri	Mudflats, muddy pools	Migrant	Uncommon
Short-billed Dowitcher Limnodromus griseus	Mudflats, shorelines	Migrant	Uncommon
Stilt Sandpiper Micropalama himantopus	Mudflats, shallow ponds	Migrant	Uncommon
Buff-breasted Sandpiper Tryngites subruficollis	Dry fields, short grassland	Migrant	Rare
American Avocet Recurvirostra americana	Shores, shallow water	Migrant	Uncommon
Sanderling Calidris alba	Shores, mud-flats	Migrant	Uncommon
Wilson's Phalarope Steganopus tricolor	Shallow lakes, mudflats, shores	Migrant	Rare
Herring Gull Larus argentatus	Water habitats	Winter	Uncommon
Ring-billed Gull Larus delawarensis	Water habitats	Winter	Common
Forster's Tern Sterna forsteri	Water habitats	Migrant	Common
Least Tern Sterna albifrons	Water habitats	Migrant	Rare
Caspian Tern Hydroprogne caspia	Water habitats	Migrant	Uncommon
Black Tern Chlidonias nigra	Water habitats	Migrant	Common
Black Skimmer Rynchops nigra	Open water habitats	Wanderer	Accidental
COLUMBIFORMES			
Rock Dove Columbia livia	Farmlands, urban areas	Permanent	Common*+
Mourning Dove Zenaida macroura	Wooded areas, pastures	Permanent	Common*+
Inca Dove Scardafella inca	Urban areas	Wanderer	Accidental
CUCULIFORMES			
Yellow-billed Cuckoo Coccyzus americanus	Wooded areas	Summer	Common*+
Black-billed Cuckoo Coccyzus erythropthalmus	Wooded areas	Migrant	Uncommon+
Roadrunner Geococcyz californianus	Open country	Permanent	Uncommon*+

Table D-29 (continued)

STRIGIFORMES			
Barn Owl *Tyto alba*	Open country, marshes	Winter	Rare
Screech Owl *Otus asio*	Wooded areas, urban areas	Permanent	Common*+
Great Horned Owl *Bubo virginianus*	Wooded areas	Permanent	Common*+
Barred Owl *Strix varia*	Wooded areas	Permanent	Common*+
Short-eared Owl *Asio flammeus*	Open areas near woodlands	Winter	Occasional
CAPRIMULGIFORMES			
Chuck-will's Widow *Caprimulgus carolinensis*	Wooded lowlands	Summer	Common*+
Whip-poor-will *Caprimulgus vociforus*	Woodlands	Migrant	Common+
Common Nighthawk *Chordeiles minor*	Varied habitats	Summer	Common*+
APODIFORMES			
Chimney Swift *Chaetura pelagica*	Urban areas, woodlands	Summer	Common*+
Ruby-throated Hummingbird *Archilochus colubris*	Varied habitats	Summer(A)	Common*+
CORACIIFORMES			
Belted Kingfisher *Megaceryle alcyon*	Water habitats	Permanent	Common*+
PICIFORMES			
Common Flicker *Colaptes auratus*	Wooded areas, urban areas	Permanent	Common*+
Pileated Woodpecker *Dryocopus pileatus*	Wooded areas	Permanent	Common*+
Red-bellied Woodpecker *Centurus carolinus*	Wooded areas	Permanent	Common*+
Red-headed Woodpecker *Melanerpes erythrocephalus*	Mixed woodlands, urban areas	Permanent	Common*+
Yellow-bellied Sapsucker *Sphyrapicus varius*	Wooded areas, urban areas	Winter	Common+
Hairy Woodpecker *Dendrocopos villosus*	Wooded areas	Permanent	Common*+
Downy Woodpecker *Dendrocopos pubescens*	Wooded areas	Permanent	Common*+
Red-cockaded Woodpecker *Dendrocopos borealis*	Mature pine forests	Permanent	Rare

Table D-29 (continued)

PASSERIFORMES			
Eastern Kingbird *Tyrannus tyrannus*	Open fields and roadsides	Summer	Common*+
Western Kingbird *Tyrannus verticalis*	Open areas	Migrant	Occasional+
Scissor-tailed Flycatcher *Muscivora forficata*	Open, wooded areas, urban areas	Summer	Common*+
Great-crested Flycatcher *Myiarchus crinitus*	Woodlands, urban areas	Summer	Common*+
Eastern Phoebe *Sayornis phoebe*	Woodlands	Winter	Uncommon+
Yellow-bellied Flycatcher *Empidonax flaviventris*	Wet forests, watercourses	Migrant	Occasional+
Acadian Flycatcher *Empidonax virescens*	Woodlands	Summer	Common*+
Willow Flycatcher *Empidonax traillii*	Shrubby swamp thickets	Migrant	Rare+
Least Flycatcher *Empidonax minimus*	Woodlands and open areas	Migrant	Occasional+
Eastern Wood Pewee *Contopus virens*	Wooded areas	Summer	Common*+
Olive-sided Flycatcher *Nuttallornis borealis*	Wooded areas along watercourses	Migrant	Uncommon+
Vermillion Flycatcher *Pryocephalus rubinus*	Brushy areas near water	Winter	Accidental
Horned Lark *Eremophila alpestris*	Open fields, grassland	Permanent	Common*+
Tree Swallow *Iridoprocne bicolor*	Open country near water	Migrant	Common+
Bank Swallow *Riparia riparia*	Along watercourses	Migrant	Occasional+
Rough-winged Swallow *Stelgidopteryx ruficollis*	Near streams, lakes	Summer	Common*+
Barn Swallow *Hirundo rustica*	Rural areas, bridges	Summer	Common*+
Cliff Swallow *Petrochelidon pyrrhonota*	Along watercourses	Migrant	Uncommon+
Purple Martin *Progne subis*	Open areas, urban and rural	Summer(Λ)	Common*+
Blue Jay *Cyanocitta cristata*	Wooded areas, urban areas	Permanent	Abundant*+
Common Crow *Corvus brachyrhynchos*	Wooded areas	Permanent	Common*+
Fish Crow *Corvus ossifragus*	Lowland areas, along watercourses	Permanent	Common*+

Table D-29 (continued)

Carolina Chickadee Parus carolinensis	Wooded areas, urban areas	Permanent	Common*+
Tufted Titmouse Parus bicolor	Wooded areas, urban areas	Permanent	Common*+
White-breasted Nuthatch Sitta carolinensis	Mixed woodlands	Permanent	Uncommon*+
Red-breasted Nuthatch Sitta canadensis	Wooded areas, urban areas	Winter	Uncommon+
Brown-headed Nuthatch Sitta pusilla	Pine and mixed woodlands	Permanent	Uncommon
Brown Creeper Certhia familiaris	Wooded areas	Winter	Common+
House Wren Troglodytes aedon	Wooded areas	Migrant	Uncommon+
Winter Wren Troglodytes troglodytes	Low wooded areas	Winter	Common+
Bewick's Wren Thryomanes bewickii	Brushy areas, urban areas	Permanent	Uncommon*+
Carolina Wren Thryothorus ludovicianus	Brushy areas, urban areas	Permanent	Common*+
Long-billed Marsh Wren Telmatodytes palustris	Coarse vegetation near water	Winter	Uncommon
Mockingbird Mimus polyglottos	Open, wooded areas, urban areas	Permanent	Abundant*+
Gray Catbird Dumetella carolinensis	Wooded areas, brush, urban areas	Summer(A)	Uncommon*+
Brown Thrasher Toxostoma rufum	Wooded areas, brush, urban areas	Permanent	Common*+
American Robin Turdus migratorius	Wooded areas, urban areas	Permanent	Abundant*+
Wood Thrush Hylocichla mustelina	Wooded areas	Summer	Common*+
Hermit Thrush Catharus guttatus	Pine-hardwood forests	Winter	Common+
Swainson's Thrush Catharus ustulatus	Wooded areas	Migrant	Uncommon+
Gray-cheeked Thrush Catharus minimus	Wooded areas	Migrant	Uncommon+
Veery Catharus fuscescens	Moist, lowland forests	Migrant	Occasional+
Eastern Bluebird Sialia sialis	Open wooded areas	Permanent	Common*+
Blue-gray Gnatcatcher Polioptila caerulea	Wooded areas, thickets	Summer	Common*+
Golden-crowned Kinglet Regulus satrapa	Wooded areas, thickets	Winter	Common+

Table D-29 (continued)

Ruby-crowned Kinglet Regulus calendula	Wooded areas, thickets	Winter	Common+
Water Pipit Anthus spinoletta	Wet fields	Winter	Uncommon
Cedar Waxwing Bombycilla cedrorum	Wooded areas, urban areas	Winter	Common+
Loggerhead Shrike Lanius ludovicianus	Open areas	Permanent	Common*+
Starling Sturnus vulgaris	Croplands, open areas, urban areas	Permanent	Abundant*+
White-eyed Vireo Vireo griseus	Brushy areas	Summer	Common*+
Bell's Vireo Vireo bellii	Brushy areas	Summer	Uncommon*+
Yellow-throated Vireo Vireo flavifrons	Wooded areas	Migrant	Uncommon+
Solitary Vireo Vireo solitarius	Wooded areas	Migrant(A)	Uncommon+
Red-eyed Vireo Vireo olivaceus	Wooded areas	Summer	Common*+
Philadelphia Vireo Vireo philadelphicus	Wooded areas	Migrant	Uncommon+
Warbling Vireo Vireo gilvus	Wet wooded areas	Summer	Uncommon*+
Black-and-white Warbler Mniotilta varia	Low wooded areas	Summer	Common*+
Prothonotary Warbler Protonotaria citrea	Woodlands, swamps, near water	Summer	Common*+
Worm-eating Warbler Helmitheros vermivorus	Wooded areas	Summer	Uncommon
Golden-winged Warbler Vermivora chrysoptera	Wooded areas	Migrant	Occasional+
Blue-winged Warbler Vermivora pinus	Brushy areas	Migrant	Occasional+
Tennessee Warbler Vermivora peregrina	Wooded areas	Migrant	Common+
Orange-crowned Warbler Vermivora celata	Brushy areas	Winter	Uncommon+
Nashville Warbler Vermivora ruficapilla	Wooded areas	Migrant	Occasional+
Northern Parula Warbler Parula americana	Wet woodlands	Summer	Common*+
Yellow Warbler Dendroica petechia	Shrubs, willows streamside	Migrant	Uncommon+
Magnolia Warbler Dendroica magnolia	Woodlands	Migrant	Uncommon+

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Table D-29 (continued)

Yellow-rumped Warbler Dendroica coronata	Wooded areas, urban areas	Winter	Common+
Black-throated Green Warbler Dendroica virens	Wooded areas	Migrant	Uncommon+
Cerulean Warbler Dendroica cerulea	Wooded areas	Summer	Uncommon+
Blackburnian Warbler Dendroica fusca	Wooded areas	Migrant	Uncommon+
Yellow-throated Warbler Dendroica dominica	Wet, low woodlands	Summer	Common*+
Chestnut-sided Warbler Dendroica pennsylvanica	Brushy pastures, shrubby areas	Migrant	Uncommon+
Bay-breasted Warbler Dendroica castanea	Wooded areas	Migrant	Uncommon+
Blackpoll Warbler Dendroica striata	Brushy areas	Migrant	Occasional
Pine Warbler Dendroica pinus	Pine forests, mixed woodlands	Permanent	Common*+
Prairie Warbler Dendroica discolor	Dry, brushy areas	Summer	Common*+
Ovenbird Seiurus aurocapillus	Wooded areas	Migrant	Occasional
Northern Waterthrush Seiurus noveboracensis	Along water-courses	Migrant	Uncommon
Louisiana Waterthrush Seiurus motacilla	Along water-courses	Migrant	Common+
Kentucky Warbler Oporonis formosus	Wet woodlands	Summer	Common*+
Mourning Warbler Oporonis philadelphia	Swampy thickets, dry brushy areas	Migrant	Uncommon+
Connecticut Warbler Oporonis agilis	Swamps, thickets	Migrant	Rare+
Common Yellowthroat Geothlypis trichas	Swamps, thickets, marshes	Summer(A)	Common*+
Yellow-breasted Chat Icteria virens	Thickets and brushy clearings	Summer	Common*+
Hooded Warbler Wilsonia citrina	Wet woodlands, swamps	Summer	Common*+
Wilson's Warbler Wilsonia pusilla	Swamps, thickets	Migrant	Uncommon+
Canada Warbler Wilsonia canadensis	Woodlands	Migrant	Uncommon+
American Redstart Setophaga ruticilla	Low, wet wooded areas	Migrant	Common*+
House Sparrow Passer domesticus	Near human habitation	Permanent	Abundant*+

Table D-29 (continued)

Bobolink Dolichonyx oryzivorus	Fields and pastures	Migrant	Uncommon+
Eastern Meadowlark Sturnella magna	Fields and pastures	Permanent	Abundant*+
Western Meadowlark Sturnella neglecta	Fields and pastures	Winter	Occasional+
Yellow-headed Blackbird Xanthocephalus xanthocephalus	Open areas, marshes	Wanderer	Accidental
Red-winged Blackbird Agelaius phoeniceus	Fields, swamps, marshes	Permanent	Abundant*+
Orchard Oriole Icterus spurius	Wooded areas, urban areas	Summer	Common*+
Northern Oriole Icterus galbula	Wooded areas, urban areas	Summer(A)	Common*+
Rusty Blackbird Euphagus carolinus	Wet fields and woods	Winter	Uncommon+
Brewer's Blackbird Euphagus cyanocephalus	Fields, feedlots, pastures	Winter	Uncommon+
Common Grackle Quiscalus quiscala	Open areas, urban areas	Permanent	Abundant*+
Brown-headed Cowbird Molothrus ater	Open fields	Permanent	Abundant*+
Scarlet Tanager Piranga olivacea	Wooded areas	Migrant	Uncommon+
Summer Tanager Piranga rubra	Wooded areas	Summer(A)	Common*+
Cardinal Cardinalis cardinalis	Wooded areas, brushland, urban areas	Permanent	Abundant*+
Rose-breasted Grosbeak Pheucticus ludovicianus	Wooded areas	Migrant	Uncommon+
Blue Grosbeak Guiraca caerulea	Wooded areas, thickets, roadsides	Summer	Common*+
Indigo Bunting Passerina cyanea	Wooded areas, thickets, roadsides	Summer	Common*+
Painted Bunting Passerina ciris	Wooded areas, farmyards, roadsides	Summer	Uncommon*+
Dickcissel Spiza americana	Grasslands	Summer(A)	Common*+
Evening Grosbeak Hesperiphona vespertina	Wooded areas, urban areas	Winter	Occasional+
Purple Finch Carpodacus purpureus	Wooded areas, urban areas	Winter	Common+

Table D-29 (continued)

Pine Siskin Spinus pinus	Wooded areas, urban areas	Winter	Occasional+
American Goldfinch Spinus tristis	Open woods, urban areas	Winter	Common+
Red Crossbill Loxia curvirostra	Pine woods	Winter	Rare
Rufous-sided Towhee Pipilo erythrophthalmus	Brushy areas, thickets	Winter	Common+
Savannah Sparrow Passerculus sandwichensis	Fields and pastures	Winter	Common+
Grasshopper Sparrow Ammodramus savannarum	Grassland	Summer (A)	Occasional
LeConte's Sparrow Ammospiza lecontii	Wet, weedy areas	Winter	Occasional+
Vesper Sparrow Pooecetes gramineus	Open fields	Winter	Uncommon
Lark Sparrow Chondestes grammacus	Weedy fields and pastures	Summer	Uncommon+
Bachman's Sparrow Aimophila aestivalis	Open pine woods, old fields	Summer	Uncommon
Dark-eyed Junco Junco hyemalis	Wooded areas, urban areas	Winter	Common+
Tree Sparrow Spizella arborea	Open, brushy areas	Winter	Rare+
Chipping Sparrow Spizella passerina	Open, mixed woodlands	Winter	Common+
Field Sparrow Spizella pusilla	Brushy pastures and clearings	Permanent	Common*+
Harris' Sparrow Zonotrichia querula	Open and brushy areas	Winter	Occasional+
White-crowned Sparrow Zonotrichia leucophrys	Brushy edges, tangles	Winter	Common+
White-throated Sparrow Zonotrichia albicollis	Wooded areas, urban areas	Winter(A)	Abundant+
Fox Sparrow Passerella iliaca	Woodlands, tangles, thickets	Winter	Common+
Lincoln's Sparrow Melospiza lincolnii	Brushy areas, wet thickets	Winter	Common+
Swamp Sparrow Melospiza georgiana	Weedy, wet areas	Winter	Common+

Table D-29 (continued)

Song Sparrow Melospiza melodia	Open woodlands, edges	Winter	Common+
Lapland Longspur Calcarius lapponicus	Open fields, pastures	Winter	Uncommon
Smith's Longspur Calcarius pictus	Open fields, pastures	Winter	Uncommon

SEASONAL STATUS

A - additional records

RELATIVE ABUNDANCE

Abundant - large numbers
Common - can be found every day in the right habitat
Uncommon - can be expected in the right habitat, but not always found
Occasional - not seen every year
Rare - 5 records or less
Accidental - out of known range

* Breeds in Jefferson County
\+ Found within one mile of Bayou Bartholomew

This list was prepared by Jane E. Stern from Jefferson Audubon Society records, 1965-1975.

Taxonomy and nomenclature are according to the American Ornithologists' Union, Check-List of North American Birds, 5th ed. (and Thirty-second Supplement).

Table D-30
Mammals of the Pine Bluff Study Area*

SPECIES	HABITAT	RELATIVE ABUNDANCE
Didelphis virginiana Opossum	All wooded areas	Common
Cryptotis parva Least Shrew	Grassy fields and thickets on edge of woodlands	Common
Blarina brevicauda Shorttail Shrew	Wooded areas throughout	Common
Scalopus aquaticus Eastern Mole	Upland woods	Common
Myotis austroriparius Little Brown Bat	Trees, buildings, culverts	Uncommon
Pipistrellus subflavus Eastern Pipistrel	Old buildings, farm houses	Uncommon
Lasiurus borealis Red Bat	Large trees	Uncommon
Eptesicus fuscus Big Brown Bat	Old buildings, farm houses	Uncommon
Lasiurus cinereus Hoary Bat	Migrant, old buildings, farm houses	Uncommon
Nycticeius humeralis Evening Bat	Hollow trees, old buildings	Common
Procyon lotor Raccoon	Bottomland hardwoods, uplands	Common
Mustela frenata Longtail Weasel	Wooded areas	Uncommon
Mustela vison Mink	Bottomlands, backwater areas	Uncommon
Lutra canadensis River Otter	Water courses	Uncommon
Mephitis mephitis Striped Skunk	Bottomlands	Common
Spilogale putorius Eastern Spotted Skunk	Woodlands	Uncommon
Canis latrans Coyote	Remote areas throughout	Uncommon
Vulpes fulva Red Fox	Pine-hardwood forests	Uncommon
Urocyon cinereoargenteus Grey Fox	Pine-hardwood forests bordering pastures	Uncommon

Table D-30 (continued)

Lynx rufus Bobcat	Extensive forests	Uncommon
Sciurus carolinensis Eastern Gray Squirrel	All wooded areas	Common
Sciurus niger Eastern Fox Squirrel	Open hardwood	Common
Marmota monax Woodchuck	Forest edges	Uncommon
Glaucomys volans Southern Flying Squirrel	Forested areas	Common
Geomys bursarius Plains Pocket Gopher	Well drained uplands	Uncommon
Castor canadensis Beaver	Woodland waterways	Common
Reithrodontomys fulvescens Fulvous Harvest Mouse	Old fields, thickets, forest borders with dense vegetation	Common
Peromyscus leucopus White-footed Mouse	Forests and forest borders	Common
Peromyscus maniculatus Deer Mouse	Open areas and woodlands	Common
Peromyscus gossypinus Cotton Mouse	Forest and forest borders	Common
Ochrotomys nuttalli Golden Mouse	Mixed pine-hardwoods	Common
Neotoma floridana Eastern Wood Rat	Hardwood bottomland forests	Uncommon
Oryzomys palustris Rice Rat	Wet marshy areas, stream and lake edges	Uncommon
Sigmodon hispidus Hispid Cotton Rat	Old fields, thickets	Common
Microtus pinetorum Woodland Vole	Hardwood forests with abundant leaf litter	Uncommon
Ondatra zibethicus Muskrat	Water courses with adequate vegetation for cover and nesting	Common
Rattus norvegicus Norway Rat	Urban areas, fields	Common
Rattus rattus Roof Rat	Urban areas, fields	Common
Mus musculus House Mouse	Urban areas, fields	Common
Myocastor coypus Nutria	Streams and lakes with herbaceous vegetation	Uncommon

Table D-30 (continued)

Sylvilagus floridanus Eastern Cottontail	Edges of upland hardwoods	Common
Sylvilagus aquaticus Swamp Rabbit	Edges of bottomland hardwoods	Common
Odocoileus virginianus Whitetail Deer	Forests	Common
Dasypus novemcinctus Nine-banded Armadillo	Pines and upland hardwoods	Common

* This list is based on Pinkham et al. (1972), Lowery (1974), and field observations of VTN Louisiana, Inc. It should be considered relatively complete for the Study Area.

Table D-31

Distribution and Per Cent Composition of Overstory Plants in the Willow-Cypress Association: Transects 1 and 2

SPECIES	COMMON NAME	TRANSECT 1	TRANSECT 2	TOTAL	PER CENT COMPOSITION
Salix nigra	Black Willow	11	5	16	43
Populus deltoides	Eastern Cottonwood	6	-	6	16
Taxodium distichum	Baldcypress	-	4	4	11
Celtis laevigata	Hackberry	-	4	4	11
Fraxinus tomentosa	Pumpkin Ash	-	4	4	11
Carya aquatica	Water Hickory	-	3	3	8
TOTALS		17	20	37	100

Table D-32

Distribution and Per Cent Composition of Overstory Plants in the River Birch-Buttonbush Community:

Transects 3,4,5,and 6

SPECIES	COMMON NAME	TRANSECT 3	4	5	6	TOTAL	PER CENT COMPOSITION
Betula nigra	River Birch	28	-	9	24	61	25
Salix nigra	Black Willow	3	56	-	-	59	25
Taxodium distichum	Baldcypress	-	-	5	13	18	8
Cephalanthus occidentalis	Buttonbush	12	-	3	2	17	7
Carya aquatica	Water Hickory	-	-	15	1	16	7
Carya illinoensis	Sweet Pecan	-	-	12	-	12	5
Carya sp.	Hickory	-	-	15	-	15	6
Ulmus crassifolia	Cedar Elm	-	-	4	12	16	7
Ulmus americana	American Elm	-	-	7	-	7	3
Ilex decidua	Deciduous Holly	-	-	4	-	4	2
Quercus phellos	Willow Oak	-	-	3	-	-	1
Quercus sp.	Oak	-	-	3	1	4	2
Liquidambar styraciflua	Sweetgum	3	-	-	-	3	1
Gleditsia aquatica	Water Locust	-	-	3	-	3	1
Fraxinus tomentosa	Pumpkin Ash	-	-	1	-	1	<1
Acer negundo	Boxelder	-	1	-	-	1	<1
TOTALS		46	57	84	53	240	100

Table D-33

Distribution and Per Cent Composition of Overstory Plants in the Locust-Water Hickory Association:

Transects 7 and 8

SPECIES	COMMON NAME	TRANSECT 7	TRANSECT 8	TOTAL	PER CENT COMPOSITION
Gleditsia aquatica	Water Locust	6	6	12	12
Gleditsia triacanthos	Honey Locust	-	2	2	2
Ulmus americana	American Elm	10	2	12	12
Ulmus crassifolia	Cedar Elm	-	10	10	10
Ulmus alata	Winged Elm	-	4	4	4
Carya aquatica	Water Hickory	6	5	11	11
Quercus phellos	Willow Oak	-	10	10	10
Quercus nigra	Water Oak	6	-	6	6
Quercus nuttallii	Nuttall Oak	-	3	3	3
Quercus stellata	Post Oak	-	3	3	3
Quercus michauxii	Cow Oak	1	1	2	2
Quercus alba	White Oak	1	-	1	1
Taxodium distichum	Baldcypress	4	2	6	6
Celtis laevigata	Hackberry	6	-	6	6
Fraxinus tomentosa	Pumpkin Ash	3	2	5	4
Liquidambar styraciflua	Sweetgum	-	4	4	4
Ostrya virginana	Hop Hornbean	-	1	1	1
Salix nigra	Black Willow	1	-	1	1
Morus rubra	Red Mulberry	-	1	1	1
Nyssa sylvatica	Blackgum	1	-	1	1
TOTALS		45	56	101	100

Table D-34

Distribution and Per Cent Composition of Overstory Plants in the Water Oak-River Birch Association: Transects 9,10,and 11

SPECIES	COMMON NAME	TRANSECT 9	TRANSECT 10	TRANSECT 11	TOTAL	PER CENT COMPOSITION
Betula nigra	River Birch	13	14	-	27	14
Quercus nigra	Water Oak	9	11	3	23	12
Quercus phellos	Willow Oak	-	1	-	1	<1
Carpinus caroliniana	Blue Beech	16	7	-	23	12
Carya illinoensis	Sweet Pecan	-	-	21	21	10
Carya aquatica	Water Hickory	-	-	3	3	2
Liquidambar styraciflua	Sweetgum	8	4	8	20	10
Celtis laevigata	Hackberry	-	-	19	19	10
Maclura pomifera	Osage Orange	-	-	12	12	6
Hamamelis sp.	Witch Hazel	11	-	-	11	6
Gleditsia triacanthos	Honey Locust	-	-	10	10	5
Pinus taeda	Loblolly Pine	10	-	-	10	5
Diospyros virginiana	Persimmon	-	-	8	8	4
Ulmus americana	American Elm	1	1	3	5	2
Ulmus alata	Winged Elm	1	1	-	2	1
Cercis canadensis	Redbud	-	-	2	2	1
Ostrya virginiana	Hop Hornbeam	-	1	-	1	<1
Fraxinus americana	White Ash	-	1	-	1	<1
TOTALS		69	41	89	199	100

Table D-35

Distribution and Per Cent Composition of
Overstory Plants in the
White Oak-Sweetgum Association:

Transects 12 and 13

SPECIES	COMMON NAME	TRANSECT 12	TRANSECT 13	TOTAL	PER CENT COMPOSITION
Quercus alba	White Oak	7	6	13	18
Quercus nigra	Water Oak	7	5	12	17
Quercus falcata	So. Red Oak	4	2	6	8
Quercus shumardii	Shumard Oak	-	3	3	4
Quercus stellata	Post Oak	2	-	2	3
Quercus phellos	Willow Oak	1	-	1	1
Liquidambar styraciflua	Sweetgum	7	5	12	17
Fagus grandifolia	American Beech	5	-	5	7
Diospyros virginiana	Persimmon	2	2	4	6
Carya sp.	Hickory	-	4	4	6
Pinus taeda	Loblolly Pine	4	-	4	6
Fraxinus americana	White Ash	-	3	3	4
Castanea sp.	Chestnut	1	-	1	1
Sassafras albidum	Sassafras	-	1	1	1
Ulmus alata	Winged Elm	-	1	1	1
TOTALS		40	32	72	100

Table D-36

Distribution and Per Cent Composition of Overstory Plants in the Pine-Post Oak Association: Transects 14,15,16,17 and 18

SPECIES	COMMON NAME	TRANSECT 14	15	16	17	18	TOTAL	PER CENT COMPOSITION
Pinus taeda	Loblolly Pine	8	11	6	26	22	73	22
Liquidambar styraciflua	Sweetgum	8	13	18	8	6	53	16
Quercus stellata	Post Oak	7	17	12	6	6	48	14
Quercus falcata	Southern Red Oak	6	7	10	2	1	26	8
Quercus alba	White Oak	9	7	1	8	-	25	8
Quercus nigra	Water Oak	-	-	3	-	6	9	3
Quercus marilandica	Blackjack Oak	7	-	-	-	-	7	3
Quercus shumardii	Shumard Oak	3	-	-	-	-	3	<1
Quercus phellos	Willow Oak	-	-	1	-	1	2	<1
Nyssa sylvatica	Blackgum	4	1	21	-	11	37	11
Acer rubrum	Red Maple	-	7	6	4	5	22	7
Fagus grandifolia	American Beech	-	-	-	-	16	16	5
Ulmus alata	Winged Elm	-	-	-	1	6	7	3
Carya cordiformis	Bitternut Hickory	-	-	-	3	-	3	<1
Carya illinoensis	Sweet Pecan	-	-	-	-	1	1	<1
Sassafras albidum	Sassafras	-	-	1	-	-	1	<1
TOTALS		52	63	79	58	81	333	100

Table D-37

Distribution and Per Cent Composition of Overstory Plants in Cleared Areas:

Transects 19 and 20

SPECIES	COMMON NAME	TRANSECT 19	TRANSECT 20	TOTAL	PER CENT COMPOSITION
*Prunus americana**	American Plum	-	-	-	-
Salix nigra	Black Willow	12	5	17	38
Platanus occidentalis	American Sycamore	6	7	13	29
Disopyros virginiana	Persimmon	-	3	3	7
Acer rubrum	Red Maple	-	1	1	2
Gleditsia triacanthos	Honey Locust	-	11	11	24
TOTALS		18	27	45	100

* Species occurred in thickets, too numerous to count.

Table D-38

Distribution and Per Cent Composition of Overstory Plants in the Urban Areas:

Transects 21 through 31

SPECIES	COMMON NAME	TRANSECT 21	22	23	24	25	26	27	28	29	30	31	TOTAL	PER CENT COMPOSITION
Liquidambar styraciflua	Sweetgum	4	-	1	-	4	-	-	-	21	-	3	33	15.2
Ulmus americana	American Elm	-	-	-	-	2	-	-	-	-	-	17	19	8.7
Ulmus alata	Winged Elm	-	-	-	-	-	-	-	-	-	-	1	1	0.4
Quercus nigra	Water Oak	6	-	5	-	-	-	-	-	6	-	-	17	7.9
Quercus phellos	Willow Oak	5	-	-	-	-	-	1	-	-	-	-	6	2.9
Quercus alba	White Oak	6	-	-	-	-	-	-	-	-	-	-	6	2.9
Quercus sp.	Oak	2	-	2	-	-	2	-	-	-	-	-	6	2.9
Quercus stellata	Post Oak	3	-	-	-	-	-	-	-	-	-	-	3	1.4
Carya illinoensis	Sweet Pecan	-	-	1	3	3	-	-	-	9	-	-	16	7.5
Carya sp.	Hickory	-	-	-	-	-	-	-	-	-	-	10	10	4.5
Carya sp.	Pecan	1	-	-	-	-	-	-	-	-	-	-	1	0.4
Salix nigra	Black Willow	-	7	4	-	1	3	-	-	-	-	-	15	6.8
Platanus occidentalis	American Sycamore	1	-	1	-	7	1	-	-	1	-	-	11	5.1
Pinus taeda	Loblolly Pine	9	-	1	-	-	-	-	-	-	-	-	10	4.5
Pinus echinata	Shortleaf Pine	-	-	1	-	-	-	-	-	-	-	-	1	0.4
Albizia julibrissin	Mimosa Tree	7	1	-	-	-	-	-	-	-	-	-	8	3.8
Morus rubra	Red Mulberry	-	-	-	2	-	-	-	-	-	-	6	8	3.8
Prunus serotina	Black Cherry	1	-	4	-	-	-	-	-	1	-	-	6	2.9
Juniperus virginiana	Red Cedar	3	-	-	-	-	-	-	-	2	-	-	5	2.4

Table D-38 (cont.)

SPECIES	COMMON NAME	TRANSECT* 21	22	23	24	25	26	27	28	29	30	31	TOTAL	PER CENT COMPOSITION
Cercis canadensis	Redbud	-	1	-	2	-	-	2	-	-	-	-	5	2.4
Nyssa sylvatica	Blackgum	1	-	1	-	-	-	1	-	-	-	1	4	1.8
Diospyros virginiana	Persimmon	1	-	-	-	-	-	-	-	3	-	-	4	1.8
Camellia sasanqua	Camellia	-	-	-	-	-	-	1	-	-	-	-	1	0.4
Camellia japonica	Camellia	-	-	-	-	-	-	4	-	-	-	-	4	1.8
Thuja occidentalis	Eastern White Cedar	2	-	-	-	-	-	-	-	-	-	-	2	0.9
Magnolia grandiflora	Southern Magnolia	-	-	-	1	-	-	1	-	-	-	-	2	0.9
Ligustrum vulgare	Common Privet	-	-	-	-	-	-	1	-	-	-	-	1	0.4
Acer saccharinum	Silver Maple	1	-	-	-	-	-	-	-	-	-	-	1	0.4
Acer negundo	Boxelder	-	-	-	-	-	-	1	-	-	-	-	1	0.4
Acer rubrum	Red Maple	-	-	-	-	-	-	-	-	-	-	1	1	0.4
Liriodendron tulipifera	Tulip Tree	1	-	-	-	-	-	-	-	-	-	-	1	0.4
Podocarpus macrophyllis	Podocarpus	1	-	-	-	-	-	-	-	-	-	-	1	0.4
Fraxinus sp.	Ash	-	-	1	-	-	-	-	-	-	-	-	1	0.4
Pyrus malus		-	-	-	1	-	-	-	-	-	-	-	1	0.4
Catalpa sp.	Catalpa	-	-	-	-	1	-	-	-	-	-	-	1	0.4
Populus deltoides	Eastern Cottonwood	1	-	-	-	-	-	-	-	-	-	-	1	0.4
Populus alba	White Poplar	-	-	-	-	-	1	-	-	-	-	-	1	0.4
Ilex opaca	Holly	-	-	-	-	-	-	1	-	-	-	-	1	0.4
Robinia pseudo-acacia	Black Locust	-	-	-	-	-	-	-	-	1	-	-	1	0.4
Symplocos tinctoria	Common Sweetleaf	-	-	-	-	-	-	-	-	-	-	1	1	0.4
TOTALS		56	9	22	9	18	7	13	0	44	0	40	218	100.0

Appendix E

Socioeconomic Elements

SOCIOECONOMIC METHODS

A. Methodology for Projecting Employment. Projections for total employment were made by the Bureau of Economic Analysis (BEA). Employment was then broken down by broad industrial sources using the total figures as a control. Agricultural employment was held constant assuming that automation on the farm is about at its peak. The other areas of employment were held at the same ratio as in 1970. Manufacturing employment was prorated to each industry according to projected earnings.

B. Methodology for Projecting Bank Deposits. Historic bank deposits were projected using linear regression.

C. Methodology for Projecting Value Added by Manufacturing. Historic value added by manufacturing was projected using linear regression.

D. Methodology for Projecting Retail and Wholesale Trade. Linear regression analysis was applied to historic data to project retail and wholesale trade.

E. Methodology for Projecting Value of Farm Products Sold. Linear regression analysis was applied to historic total value of farm products sold to make the projections.

F. Methodology for Projecting White, Negro, and Other Populations. The Negro population was projected using linear regression analysis, the other population was held constant at one per cent, and the white population was taken as the residual of the BEA projected total population.

G. Methodology for Projecting Population by Sex and Age Group. These data were tabulated for the census years 1960 and 1970. Gross survival ratios were then established for each age-sex cohort group based on the changes that took place between 1960-1970. These historical ratios were used as the base for projecting population for 1985, 2000, and 2020. BEA projected total population was then broken down by sex and age group based on percentages in each group as projected using the cohort group.

H. Methodology for Projecting Rural and Urban Population. Rural population was projected for 1985 and 2000 using linear regression analysis and was assumed to remain constant from 2000 to 2020. Urban population was taken as the residual of the BEA projected total population.

I. <u>Methodology for Projecting Total and Per Capita Income</u>. Projections for total and per capita income were taken straight from BEA.

J. <u>Methodology for Projecting Earnings by Type and Broad Industrial Sources</u>. These projections were made by BEA.

Table E-1
Recreational Resources Inventory of the Pine Bluff Area: Fall, 1974
(Modified from the Pine Bluff Parks and Recreation Department)

No.	Name	Acreage	Administration*	Accessibility	Door Oriented	Percent of Completed Development	Is This An Inventory For A New Area or Facility Developed Since 1970?	Has There Been A Change In Ownership and/or Facilities To The Recreation Area Since 1968/70?	Has There Been A Change in Administration Since 1970	Primary Attraction of Recreational Area 1. Land Based 2. Water Based 3. Air Sports 4. Historical/Architectural Site 5. Indoor Activities 6. Archeological Site	Is Any Acquisition of Development Planned In Next Two Years? 1. Expansion of Existing Facility or Area 2. Development of Completely New Area	Amount of Indoor Facility Under Recreational Use?	Acreage: A. Land Only B. Water C. Wetland	Gross Water Front	Total Visitations: D - Day-time N - Night-time O - Over-night	Season: A. All Year B. Summer Only C. Spring, Summer and Fall Only D. Winter Only	Percent Distribution of Total Annual Visits By Month: A. Summer B. Fall & Winter C. Spring	Origin of Visitors To This Area: A. Majority Originating from Walking Distance B. Majority Originating from 1 to 25 Miles C. Majority Originating from 26 to 50 Miles D. Majority Originating from 51 to 150 Miles E. Majority Originating from 151 and Over	Fees Charged Monthly: A. Membership Only B. Other Admission or User Fee C. None
1.	Rosswood Country Club	300	6	10 mi.	Out	All	No	No	No	1	No 1,2		A. 189.6			A.			A. $23.00
2.	Lakeside Elem. School	2	5	1/0 mi.	Out	All	No	No	No	1	No 1,2	12,201 sq.ft.	A. 1 ac.						
3.	Gabe Meyer Elem. School	2½	5	1/4 mi.	Out	All	No	No	No	1	No 1,2	23,314 sq.ft.	A. 2 ac.						
4.	Barnes Memorial School	2	5				No	No	No	1	No 1,2								
5.	Pine Bluff Country Club	200	6	4 mi.	Out	All	No	No	No	1	No 1,2		A. 144 ac			A.			A. $41.00
6.	Belair Junior High School	40	5	1/4 mi.	In	All	No	No	No	1	No 1,2	75,790 sq.ft.	A. 30 ac.						
7.	Belair Elementary School	1/10	5		Out	All	No	No	No	1	No 1,2								
8.	Indiana Elementary School	15	5	1/10 mi.	In Out	All	No	No	Yes	1	No 1,2	26,916 sq.ft.	A. 4 ac.						
9.	Southwood Elem. School	10	5	3 mi.	Out	All	No	No	No	1	No 1,2	33,153 sq.ft.	A. 28 ac						
10.	Carver Elementary School	3	5	1/2 mi.	Out		No	No	No	1	No 1,2	24,644 sq.ft.	A. 5 ac.						
11.	Sutran Country Club	12.2	6		Out	All	No	No	No	1,2	No 1,2	.	-						
12.	Broadmoor Elem. School	15-20	5 5	1/2 mi.	Out	All	No	No	No	1	No	24,644 sq.ft.	A. 10 ac			C.			
13.	Greenville Elem. School	8	5	3 mi.	Out	All	No	No	No	1	Yes 1,2	26,127 sq.ft.	A. 8 ac.						
14.	Thirty-Fourth Avenue School	8	5	1/2 mi.	Out	All	No	No	No	4	No 1,2	37,028 sq.ft.	A. 8 ac.		D. 100%	C.	A.10% B.60% C.30%	B.	C.
15.	Forrest Park Elem. School	10	5	2 mi.	Out	All	No	No	No	1	No 1,2	210,418 sq.ft.	A. 4 ac.		D. 100%	C.	A.10% B.60% C.30%	B.	C.
16.	Citizen Boys Club	8	6	1/2 mi.	In		No	No	No	5					D-50% N-50%	A.		B.	A. $.50
17.	First Ward Elem. School	3	5	1/5 mi.	Out	All	No	No	No	1	No 1,2	19,989 sq.ft.	A. 3 ac.		D. 100%	C.	A.10% B.60% C.30%	B.	C.
18.	Merrill Junior High School	9	5	1/2 mi.	Out	All	No	No	No	1	No 1,2	53,204 sq.ft.	A. 9 ac.		D. 100%	C.	A.10% B.60% C.30%	B.	C.
19.	Roadside Park Hwy.65 Green Thumb	3	2		Out		Yes	Yes		1,4	No 1,2		A. 4 ac.			A.			C.
20.	Sam Taylor Elem. School	4	5	1½ mi.	Out	All	No	No	No	1	No 1,2	20,046 sq.ft.	A. 4 ac.		D. 100%	C.	A.10% B.60% C.30%	B.	C.
21.	Oak Park Elem. School	15	5	1/5 mi.	Out	All	No	No	No	1	No 1,2	31,343 sq.ft.	A. 10 ac.				A.10% B.60% C.30%	B.	C.
22.	Kiwanas Girl Scout Camp Taloha	160	6	10 mi.	Out	All	No	No	No	1	Yes-1 No-2		A. 160 ac. B.22ac.			C.	A.80% B.20%	C.	C.
23.	Dollarway School Dist. Three Sites	11	5		In Out	All	No	No	No	1			A. 11 ac.			C.	A.10% B.60% C.30%	B.	C.

Table E-1 (continued)

No.	Name	Acreage	Administration *	Accessibility	Door Oriented	Percent of Completed Development	Is This An Inventory For A New Area or Facility Developed Since 1970?	Has There Been A Change In Ownership and/or Facilities To The Recreation Area Since 1968/70?	Has There Been A Change in Administration Since 1970	Primary Attraction of Recreational Area 1. Land Based 2. Water Based 3. Air Sports 4. Historical/Architectural Site 5. Indoor Activities 6. Archeological Site	Is Any Acquisition of Development Planned In Next Two Years? 1. Expansion of Existing Facility or Area 2. Development of Completely New Area	Amount of Indoor Facility Under Recreational Use?	Acreage: A. Land Only B. Water C. Wetland	Gross Water Front	Total Visitations: D - Day-time N - Night-time O - Over-night	Season: A. All Year B. Summer Only C. Spring, Summer and Fall Only D. Winter Only	Percent Distribution of Total Annual Visits By Month: A. Summer B. Fall & Winter C. Spring	Origin of Visitors To This Area: A. Majority Originating from Walking Distance B. Majority Originating from 1 to 25 Miles C. Majority Originating from 26 to 50 Miles D. Majority Originating from 51 to 150 Miles E. Majority Originating from 151 and Over	Fees Charged Monthly: A. Membership Only B. Other Admission or User Fee C. None
24.	Southeast Junior High School	20	5	1/6 mi.	Out		No	No	No	1	No 1,2	59,340 sq.ft.	A. 20 ac.		D-90% N-10%			B.	C.
25.	Circle "T" Ranch	700	6	1 mi.	Out	All	No	No	No	1	No 1,2		A. 640 ac. B.60 ac.			A.		B.	C.
26.	Pine Bluff Senior High School	40	5	1 mi.	Out	All	No	No	Yes	1	No-1 Yes-2	2,680,581 sq.ft.	A. 41 ac.						
27.	Sherrill School Playground	5	5	0	Out	All	No	No	No	1	No 1,2		A. 5 ac.			E.		B.	C.
28.	Altheimer School Playground	10	5	0	Out In	All	No	No	No	1	No 1,2	4,500 sq.ft.	A. 7 ac.			A.		A.	C.
29.	Pine Bluff Arsenal Playground	4	5	0	Out In		No	No	No	1,5	No 1,2		A. 4 ac.		D-220	A.			
30.	White Hall City Park	20	4	1 mi.	Out	40%	Yes	No	No	1	Yes No-1 No-2		A. 20 ac.		D 4,000	A.	A.80% B.10% C.10%	B.	C.
31.	White Hall School Dist.-Three Sites	10	5	0	Out In	All	No	No	No	1,5	No 1,2		A. 8 ac.		D-850	A.		B.	
32.	Redfield School Playground	12	5	0	Out		No	No	No	1	No 1,2		A. 12 ac.		D 1,000	A.		B.	
33.	Little Bayou Meto	20	1	3 mi.	Out	95%	No	No	No	2	No 1,2	None	A. 20 ac.	¼ mi.	D 28,000	A.	A.60% B.10% C.30%	C.	C.
34.	Wabbaseka	5	5		Out In	85%	No	No	No	1,5	Yes-1 No-2		A. 5 ac.			E.		B.	
35.	St. Marie	59	1	3 mi.	Out	75%	No	No	No	2	Yes-1 No-2	None	A. 59 ac.	½ mi.	D 180,000	A.		B.	C.
36.	Trulock	32	1	3 mi.	Out	75%	No	No	No	2	Yes-1 No-2	None	A. 32 ac.	¼ mi.	D 78,000	A.	A.60% B.10% C.30%	B.	C.
37.	Linwood School Playground	4	5		Out In		No	No	No	1	No 1,2	None	A. 2 ac.			E.		B.	
38.	Rising Star	110	1	3 mi.	Out	80%	No	No	No	2	Yes-1 No-2	None	A. 110 ac.	¼ mi.	D 49,000	A.	A.60% B.10% C.30%	B.	C.
39.	Tar Camp Rec. Area	66.80	1	7 mi.	Out	70%	No	No	No	2	Yes-1 No-2	None	A. 66.80 ac.	2 mi.	D 133,000	A.	A.60% B.10% C.30%	C.	C.
40.	28th & Ohio Park	.07	4	1½ mi.	Out	30%	Yes	Yes	Yes	1	Yes-1 No-2	None	A. 1.2 ac.	0	D 1,000	A.	A.80% B.10% C.10%	A.	C.
41.	Civic Center Park	14.67	4	1 mi.	Out	90%	No	No	No	1	No-1 Yes-2	150,000 sq.ft.			D-150,000 N-25,000	A.	A.33% B.33% C.33%	B.	C.
42.	3rd & Grant Park	1.0	4	2 mi.	Out	100%	No	No	No	1	No-1 No-2		A. 1.0		D-13,000 N-400	A.	A.33% B.33% C.33%	A.	C.
43.	Reed Lake	41	6	3 mi.	Out		No	No	No	2	No 1,2	None							
44.	Horseshoe Lake	101	6		Out		No	No	No	2	No 1,2	None							
45.	University of Ark. at Pine Bluff	22.5	2	1 mi.	In/Out		Yes	No	No	1	No 1,2		A. 20					B. C.	B.
46.	Hutson Park	2.7	4		Out		No	No	No	1	No-1 No-2	None	A. 2.7		D-5,000 N-900	A.	A-60% B-20% C-20%	A. B.	C.

Table E-1 (continued)

No.	Name	Acreage	Administration*	Accessibility	Door Oriented	Percent of Completed Development	Is This An Inventory For A New Area or Facility Developed Since 1970?	Has There Been A Change In Ownership and/or Facilities To The Recreation Area Since 1968/70?	Has There Been A Change in Administration Since 1970	Primary Attraction of Recreational Area 1. Land Based 4. Historical/Architectural Site 2. Water Based 5. Indoor Activities 3. Air Sports 6. Archeological Site	Is Any Acquisition of Development Planned In Next Two Years? 1. Expansion of Existing Facility or Area 2. Development of Completely New Area	Amount of Indoor Facility Under Recreational Use?	Acreage: A. Land Only B. Water C. Wetland	Gross Water Front	Total Visitations: D - Day-time N - Night-time O - Over-night	Season: A. All Year B. Summer Only C. Spring, Summer and Fall Only D. Winter Only	Percent Distribution of Total Annual Visits By Month: A. Summer B. Fall & Winter C. Spring	Origin of Visitors To This Area: A. Majority Originating from Walking Distance B. Majority Originating from 1 to 25 Miles C. Majority Originating from 26 to 50 Miles D. Majority Originating from 51 to 150 Miles E. Majority Originating from 151 and Over	Fees Charged Monthly: A. Membership Only B. Other Admission or User Fee C. None
47.	Townsend Park	39.59	4	¼ mi.	Out/In	80%	No	No	No	1,2,3	Yes-1 No-2	1500 sq.ft.	A-38 a B-Pool		D-100,000 N-50,000	A.	A.60% B.20% C.20%	A. B.	C.
48.	American Legion Baseball Park	5	6	.10 mi.	Out		Yes	Yes	Yes	1	Yes-1 No-2					B.		A. B.	Team Fee
49.	Western Little League Park	5.2	6	1 mi.	Out		Yes	Yes	Yes	1	Yes-1 No-2	None	A-5.2 a			B.		A. B.	Team Fee
50.	American Little League	5.5	6	1 mi.	Out		No	No	Yes	1	Yes-1 No-2	None	A-5.2 a			B.		A. B.	Team Fee
51.	Taylor Baseball Field	4.5	4	2 mi.	Out	100%	No	No	No	1	No 1,2	None	A-2 a		D-10,000 N-40,000	A.	A-90% B-5% C-5%	A. B.	Team Fee
52.	Bush Baseball Park	2	6	1 mi.	Out			No	No	1	No 1,2	None	A-2 a					A. B.	Team Fee
53.	Eden Park Country Club	10	6	3/4 mi.			Yes	Yes	No	1,2	Yes-1 No-2	19,200 sq.ft.	A-9 B-1			A. B. (Pool)		A. B.	A-$13 mo.
54.	Johnson Lake	90	6		Out		No	No	No	2		None							
55.	Regional Park	1,145	4	0	In/Out		Yes	Yes		1,2 4,5	Yes-2	None	A-1145 a. B-40 C-200	B-10		A.			C.
56.	9th & Gum Park		4	¼ mi.	Out		No	No	No	1		None	A-.25		D-500 N-100	A.	A-33% B-33% C-33%	A. B.	C.
57.	Hensberry Lake	351	6	3 mi.	Out		No	No	No	2		None							
58.	Swan Lake	500	6	3 mi.	Out		No	No	No	2	No 1,2								
59.	Central Park	7.83	4	3/4 mi.	Out		No	No	No	1	Yes-1 No-2	None	A-7.83 a.		D-3000 N-400	A.	A-80% B-10% C-10%	A. B.	C
60.	Oakland Park	165	4	¼ mi.	Out		No	No	No	1,2	Yes-1 Yes-2	6,000 sq.ft.	A-150 B-15		D-700,000 N-6,000	A.	A-80% B-10% C-10%	B. C.	B. C.
61.	Brumps Bayou Park	3.41	4	1/10 mi.	Out		Yes	Yes	Yes	1,2	Yes-1 Yes-2	None	A-3.41			A.		A. B.	C.
62.	National Little League Park	5.9	6	2.5 mi.	Out		No		No	1	Yes-1 No-2	None	A-5.9			B.	A-100%	A. B.	
63.	Lake Pine Bluff	500	2	0	Out		No	No	No	2	No-1 No-2	None	B-500		D-25,000 N-1,000	A.	A-80% B-10% C-10%	B.	C.
64.	Eastern Little League Ballfield	4	6		Out		No	No	No	1	No 1,2	None				A.	A-80% B-10% C-10%	A. B.	C.

Table E-1 (continued)

No.	Name	Acreage	Administration*	Accessibility	Door Oriented	Percent of Completed Development	Is This An Inventory For A New Area or Facility Developed Since 1970?	Has There Been A Change In Ownership and/or Facilities To The Recreation Area Since 1968/70?	Has There Been A Change in Administration Since 1970	Primary Attraction of Recreational Area 1. Land Based 4. Historical/Architectural Site 2. Water Based 5. Indoor Activities 3. Air Sports 6. Archeological Site	Is Any Acquisition of Development Planned In Next Two Years? 1. Expansion of Existing Facility or Area 2. Development of Completely New Area	Amount of Indoor Facility Under Recreational Use?	Acreage: A. Land Only B. Water C. Wetland	Gross Water Front	Total Visitations: D - Day-time N - Night-time O - Over-night	Season: A. All Year B. Summer Only C. Spring, Summer and Fall Only D. Winter Only	Percent Distribution of Total Annual Visits By Month: A. Summer B. Fall & Winter C. Spring	Origin of Visitors To This Area: A. Majority Originating from Walking Distance B. Majority Originating from 1 to 25 Miles C. Majority Originating from 26 to 50 Miles D. Majority Originating from 51 to 150 Miles E. Majority Originating from 151 and Over	Fees Charged Monthly: A. Membership Only B. Other Admission or User Fee C. None
65.	Popular Lake	.85	4	¼ mi.	Out		No	No	No	1,2	No-1 No-2	None	B-.85	300 ft.	D-700 N-80 O-0	A.	A-60% B-20% C-20%	A. B.	C.
66.	Dial	20	5		In/ Out		No	No	No	1		5,000 sq.ft.	A-20					A. B.	C.
67.	Sixth Avenue	1	5		In/ Out	100%	No	No	No	1		11,198 sq.ft.	A-1	None		D.		A. B.	C.
68.	Packing Town	2	5		Out	100%	No	No	No	1			A-2	None		A.		A. B.	C.

* Administration
1. Federal
2. State
3. County
4. City
5. School Board
6. Parochial School, Quasi-public, Private

CITIZENS' ADVISORY COMMITTEE QUESTIONNAIRE:
PINE BLUFF ENVIRONMENTAL RESOURCES SURVEY,
PINE BLUFF URBAN WATER
MANAGEMENT STUDY

A. INTRODUCTION.

This survey is a major part of the Pine Bluff Urban Water Management Study, and will serve several functions. First, it will be used to generate a listing of the environmental resources of the Study Area which may merit preservation, enhancement or restoration, and secondly, it will initiate the first step in evaluating and correlating both environmental needs and resources of the community. It may well be that present needs cannot be met by existing resources and additional areas will have to be considered for these needs.

The listings of aesthetic and ecological resources are not final; they are for your reflection and comments. Consider each item carefully, keeping in mind the relative importance of each area. Consider the area's resiliency or sensitivity to changing conditions. Also consider areas which were not listed and add these to the list.

An enclosed map of the Study Area illustrates the location of each aesthetic and ecological area included in the questionnaire. Areas or sites you think important which are not included in the aesthetic and ecological list should be identified and enumerated on the map. For example, if you feel that the city needs a park in the southern part of town, indicate it on the map and add it to the list.

B. ESTHETIC AND ECOLOGICAL AREAS.

The list below designates environmental areas and sites which may merit preservation, restoration or enhancement. You need comment only upon those areas with which you are familiar; add additional areas and sites as you feel necessary. If you are unfamiliar with a particular area, place a check (✓) in the "unfamiliar with area" box after the item. If you strongly agree, agree or disagree that an area is suited for preservation, restoration or enhancement, place a check (✓) in the appropriate box. Space has been provided for additional remarks you may wish to make concerning each area. If you comment on particular areas, you may want to follow this procedure:

20. Bayou Bartholomew Greenbelt
    -Comment example-
    a. Important for wildlife and aesthetics; used heavily for nature study and visual enjoyment

    or

    b. Of little importance; an irresponsible proposal which infringes on the principals of land ownership

Location	List of Areas	Unfamiliar With Area	Need to Preserve, Restore, Enhance: Strongly Agree	Agree	Disagree
K10	1. Alice Brake Remarks:				
E1-M9	2. Arkansas River Remarks:				
K6	3. Arkansas River Wetlands Remarks:				
	BAYOU BARTHOLOMEW:				
A7-C9	4. Above Princeton Pike Remarks:				
C9-H11	5. Between Princeton Pike Road and Olive Street Remarks:				
H11-J14	6. Below Olive Street Remarks:				
I8	7. Boyd Point Beach Remarks:				
J7	8. Boyd Point Levee Lakes Remarks:				
I-J7	9. Boyd Point Wooded Areas Remarks:				
J7	10. Boyd Point Sanctuary (Oxidation Ponds) Remarks:				
I12	11. Bayou Imbeau Remarks:				
H8	12. Blackdog Lake Remarks:				
G-H13	13. Boggy Bayou Remarks:				
L6	14. Bream Lake Remarks:				
G9	15. Brumps Bayou Remarks:				
H11	16. Byrd Lake Remarks:				

Location	List of Areas	Unfamiliar With Area	Need to Preserve, Restore, Enhance Strongly Agree	Agree	Disagree
A3-D5	17. Caney Bayou Above Highway 65 Remarks:				
D5-G8	18. Caney Bayou Below Highway 65 Remarks:				
G7	19. Caney Bayou Wetlands Remarks:				
F-G11	20. Bayou Bartholomew Greenbelt Remarks:				
K8	21. Intl. Paper Co. Wildlife Management Area Remarks:				
L9	22. Johnson Lake Remarks:				
I-K7	23. Lake Langhofer Remarks:				
H8	24. Lake Pine Bluff Remarks:				
B10	25. Lake Taloha Remarks:				
B10-E11	26. Nevins Creek Remarks:				
I9	27. Old Lake Bed East of 21st and Ohio Remarks:				
K6	28. Ste. Marie Recreational Area Remarks:				
C11	29. Sulphur Springs Area Remarks:				
E3	30. Tripletts Bluff (P.B. Arsenal) Remarks:				
K6	31. Wilkins Lake Remarks:				

Location	List of Areas	Unfamiliar With Area	Need to Preserve, Restore, Enhance Strongly Agree	Agree	Disagree
E5	32. Yellow Bluff (P.B. Arsenal) Remarks:				
F5	33. Yellow Lake (P.B. Arsenal) Remarks:				
I10	34. Taylor Lake Remarks:				
D13-E11	35. Pigeon Creek Remarks:				
H-J7	36. Island Harbor Marina Road Remarks:				
	37.				
	38.				
	39.				
	40.				

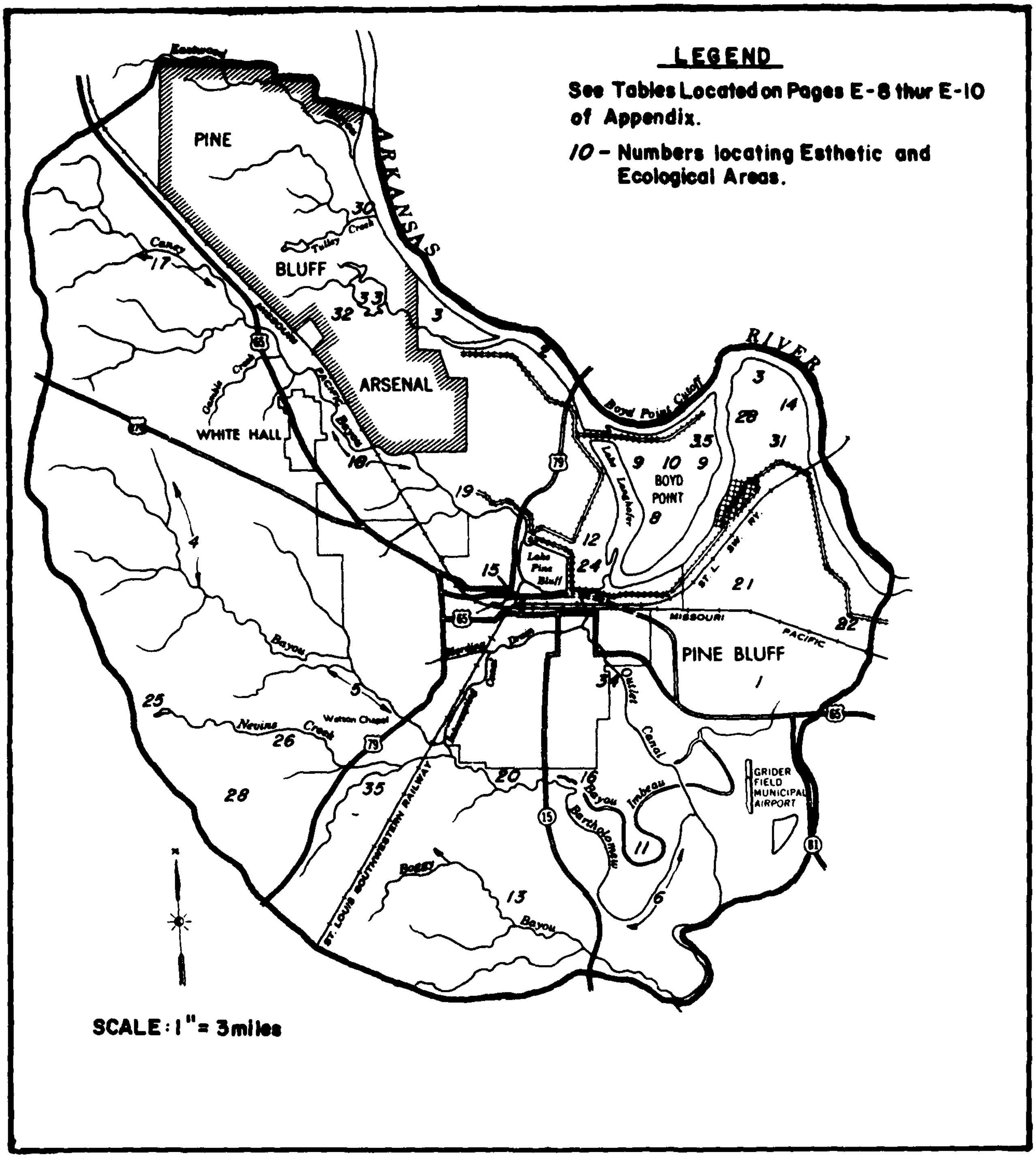


FIGURE E-1: LOCATION MAP FOR IDENTIFICATION OF ESTHETIC AND ECOLOGICAL AREAS

CITIZENS' ADVISORY COMMITTEE QUESTIONNAIRE:

PINE BLUFF URBAN WATER MANAGEMENT STUDY,
RECREATIONAL, ENVIRONMENTAL AND CULTURAL NEEDS

The Pine Bluff metropolitan area is experiencing growth-related problems and opportunities. Urbanization and related problems often have a direct or indirect effect on recreational and aesthetic use of areas and on the plants and animals in and around the urban area. The purpose of this questionnaire is to assess the recreational, environmental and cultural needs and desires of the community.

A. Circle the activities in which you or your family participate:

1. Fishing
2. Horseback riding
3. Hiking
4. Camping
5. Boating
6. Swimming
7. Outdoor sports
8. Picnicking
9. Canoeing
10. Bicycling
11. Hunting
12. Cultural activities; arts and crafts, music, fairs, etc.
13. Bird-watching and nature study
14. Others (Specify)

B. From the list below mark the environmental areas important to you and your family.

1. Fishing areas
2. Hunting areas
3. Hiking trails
4. Camping and picnicking areas (Parks)
5. Bird sanctuaries
6. Boating and canoeing areas
7. Facilities for cultural activities
8. Bridle trails
9. Undeveloped lands outside of urban community
10. Undeveloped lands and open space as part of the urban community
11. Green belts along water courses
12. Indoor and outdoor sports areas
13. Educational areas (archaeological and historical sites, nature trails, environmentally unique areas)
14. Others (Specify)

C. From the items checked in Question "B", rank by number the five most important to you and your family.

1. ____

2. ____

3. ____

4. ____

5. ____

D. Has urban and/or agricultural development or pollution affected any of the areas in Question "B"? Which?

E. List places that you feel need to be preserved for natural beauty, wildlife and/or recreation in the Pine Bluff area.

Table E-2
Public Involvement Groups
(Groups in the Pine Bluff Study Area Which Received Environmental Needs Questionnaires)

1. American Association of Retired Persons
2. Arkansas Community Organizations for Reform Now (ACORN)
3. Arkansas Power and Light Employees
4. Azalea Garden Club
5. Ben Pearson-Brunswick Division Employees
6. Cotton Belt Railroad Employees
7. Dial PTA Board of Directors
8. Dollarway Student Council
9. Gabe Meyer Teachers
10. Girl Scouts
11. Hardin Community Jaycees
12. Hardin Home Demonstration Club
13. Hudson Pulp and Paper Company Employees
14. Indian Hills Scout Troop
15. International Paper Company Employees
16. Jefferson Wildlife Association
17. Lions Club
18. Ozark Society, Delta Chapter
19. Pilot Club
20. Pine Bluff Arsenal Rod and Gun Club
21. Pine Bluff Chamber of Commerce
22. Pine Bluff Education Association
23. Pine Bluff High School Student Council
24. Pine Bluff Horticultural Club
25. Pine Bluff Jaycees Board of Directors
26. Pine Bluff League of Women Voters
27. Pine Bluff Motorcycle Club
28. Sixth Avenue Teachers
29. Society of Professional Engineers
30. Sulphur Springs Eastern Star Masons

Table E-2 (continued)

31. Trades and Labor Council
32. University of Arkansas at Pine Bluff-Faculty
33. Watson Chapel Booster Club
34. Watson Chapel Boy Scouts
35. Watson Chapel Methodist Church Men's Club
36. Watson Chapel Student Council
37. West Pine Bluff Rotary Club
38. Weyerhauser-Bay Division Employees
39. Weyerhauser-Paper Products Division Employees
40. Whitehall Boy Scouts
41. Whitehall Jaycees
42. Whitehall Saddle Club
43. Whitehall Student Council

Table E-3
Master List of Historic Structures, Pine Bluff, Jefferson County, Arkansas*

West Barraque

510
602
702
704
716
715
719
801
1215

West Second

512
520
602
604
702
703
709
717
718
800
810
909
914
919
1021
1205
1216
1300
1301
1316
1319
1502
1600
1601

West Third

609
613
803
1013

West Fourth

320
619
802
902
1000
1011
1115

Pine

625
701
800
802
825

West Eighth

1502

Linden

402

West Fifth

619
703
702
713
802
817
816
1104
1105
1117
1203
1216
1218
1308
1314
1602

West Sixth

802
1301
1414
1416
1420

West Seventh

208

Cherry

621

Beech

701

Martin

400

West Eleventh

316
316

East Fifteenth

506

West Harding

208

Business Section

White House Hotel

Table E-3 (continued)

East Second

316 917

618 1204

East Sixth

216 810

408

East Eighth

519

Georgia

624 704

State

625 1203

704 1212

Texas

1109

East Twelvth

420

Tennessee

706 708

Business Section (con't)

Shrine Temple

502 East 3rd

422 Main

State and Alabama

622 Main

Tomlinson Home

223 West Barraque

Barranco Shoe Shop

Kientz Grocery

Court House

Merchants and Planters Bank

120 East 16th

319 East 6th

216 State

End of Main

100 Main

West Barraque

120 207

200 212

205 221

115 East 2nd

Gallagher House

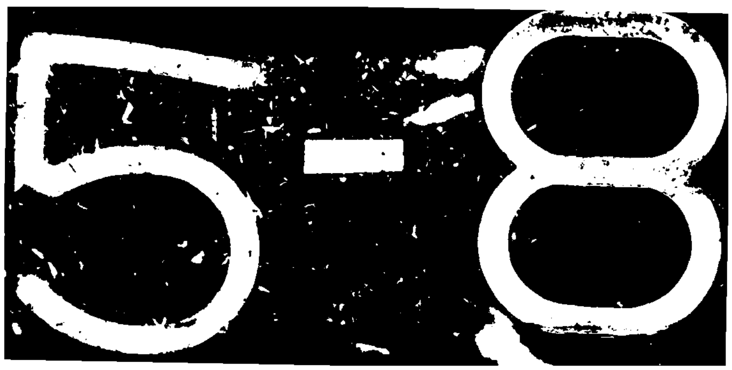
217 East 3rd

Hotel Pines

618 East 3rd

Railroad Station

* Streets and their respective street numbers.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